COAL AGE

The Only National Paper Devoted to Coal Mining and Coal Marketing

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Better Mining and Marketing

This Issue

Subsidence of the abnormal conditions of production and prices that reached their culmination in 1920 and resumption of competitive conditions have turned the thoughts of the coal industry to ways and means of better mining and marketing. From 1896 to 1920 was a period of rising prices and of intense development in the coal-mining and coal-consuming industry. The next decade at least holds the prospect of business on a gradually declining price level with coal and other industries seeking the fuller and better employment of the huge productive capacities reached during and immediately after the war.

With this thought in mind the editors of *Coal Age* seek by devoting this issue to "Better Mining and Marketing" to concentrate attention on some of the outstanding features of both. Mining and marketing go hand in hand. Better mining means safer, cheaper and more efficient production of coal, that the sales department may have a clean, low-cost product to market. Better marketing means finding the consumer whose needs are best met with that coal, getting the right price on proper terms, delivering it even under adverse conditions of transportation, collecting the money and leaving the buyer in a mood to buy again.

Without a market there would be no coal produced, and sorry indeed would be the plight of the United States even today were there no coal production. The subject is so broad that no one issue of a paper could hope to touch every angle. We are satisfied if we plant the germ of the idea that mining and marketing are interdependent parts of your industry, each indispensable one to the other, and if we create within you the desire to seek broader knowledge of the coal industry.

The New Era in Business

A vast economic laboratory best describes the world today. Looking back a few years you may recall that our political outlook was our ward, business vision was bounded by freight rates, and our knowledge of the accomplishments and problems of our neighbor operator or salesman was nil. Today we think in terms of the world. We readily reason from the day's orders for coal through the railroad's problem and the farmer's predicament to the lack of buying power of foreign peoples, back to the effect of each on the demand and market for coal.

The vast upheaval of the war may be likened to that which in prehistoric times created the Rocky Mountains. High peaks, some of rugged rock, some of softer material, were thrown up, while chasms were opened and new strata upturned and exposed to the elements. Out of the cataclysm of the war our country rises as the richest and strongest nation of the earth. Some peoples have literally been lost in the chasms. The chaos happily is almost ended and the world now faces a long period in which the quiet work of erosion of mountain peaks and filling of valleys proceeds.

In industry and business new heads have risen; some of the old are lost. New industries have come, as the development for peaceful pursuits of the airplane and the manufacture of dyes. As inexorably as the falling, rushing waters erode the mountain tops so are economic processes now operating to level off the peaks in the commercial world. The direct manifestation of the working of this leveling off is, of course, the gradual lowering of prices and the increase in the real worth of money and therefore of wages. In the end there will be reached another and opposite state of unequilibrium and another upheaval, economic or geologic, and the world begins another period or cycle of business, in the words of the economist.

What It Means to Coal

Coal is so fundamental, so basic in its relation to modern civilization, that it must feel the full effect of every play of economic force. Steel may be the barometer of business; coal certainly is the thermometer. The curve of consumption of coal tells but one thing: what has transpired. The demand for coal follows the need for power and heat.

The productive capacity of our soft-coal mines is 40 per cent above normal requirements and nearly 100 per cent above this year's needs. Costs and prices of coal, in common with other basic commodities, will diminish rapidly perhaps for awhile and then gradually for a period of years. Competition in the sale of coal will be as keen in the next decade as it was even in pre-war times. The best coals will sell the easiest; the best salesmen will sell the most coal.

For coal the new era means starting afresh to level off the inequalities in wages, prices and profits resulting from the stresses of the war and the artificial restraints of government. Quality of coal, character of service and, last of all, price will determine who is fittest to survive.

Better Mining

Winning the coal from the ground and putting it on the surface ready for market is mining. The best mining is that which makes the largest percentage of recovery at the least cost in money and in life and limb.

Increasing output and the effectiveness of labor, lessening power losses and wear, tear and decay on plant and equipment, lowering the cost of accidents and improving the quality of the product are some of the features of better mining to which special attention is directed in the pages of this issue. For every set of natural conditions—that is, thickness of coal, character of bed as to partings, impurities and friabil-

ity, kind of roof and floor, and inclination—there must be developed the best system of mining From that point forward the best mining flows from the proper use of machinery and equipment and the square and intelligent handling of labor.

That nearly 60 per cent of the bituminous coal produced in this country is undercut by machines is evidence of the progress that is being made in the use of mechanical equipment underground. But undercutting the coal is but a part of the work of mining. Loading the coal into mine cars after it is shot down from the face requires more energy than cutting, and in mechanical loading we have only begun to make progress. Eugene McAuliffe regards the possibilities of mechanical loading of coal underground as limited only by the reluctance and even active open opposition of union labor. If, as he suggests, the present outlook is for the opposition of union labor to hold back this obvious avenue of advancement for nearly a decade, then here is a tremendous field for intensive development of better mining by intelligent and wise co-ordination of mechanical engineering and human engineering.

Although we can only speculate what the next twenty-five or fifty years will show in safer, surer, quicker, cheaper mining of coal through greater and more intelligent use of mechanical equipment and the application of electricity we can actually see from week to week and year to year positive evidence of progress.

A Definition

Marketing coal is the summation of all the mechanical and commercial processes from the mine mouth to the point of consumption by which the coal is sold and delivered. Getting the signature on an order is but one small part of marketing—the final step. Production even is a part of marketing, in the sense that a marketable product must be had before it can be sold. Mining engineers could quite easily open and develop a large, well-equipped mine with low cost of operation in the lignite fields of North Dakota. Every canon of good mining could be observed, but the concept of good marketing, the production of a marketable product, would be violated and the endeavor be for naught. The phenomenal development of coal production in eastern Kentucky in the last ten years was the outcome of a vision as to market possibilities.

Transportation and storage are two factors inextricably tied up in the problem of marketing of coal, so obvious after the experiences of the past five years and so acutely before the trade today as to require but little comment and no emphasis. Here the problem of the coal producer is the reverse of that of the farmer. Nature prescribes seasonal production of food products and uniform consumption, but, though it permits uniform production of coal it requires seasonal consumption.

Credit is a part of marketing, a part that calls for infinite detail in the collection and study of information and the exercise of judgment. The credit problem may involve only the decision as to whether still another car should be shipped to a small consumer or a retail dealer—a matter perhaps of a few hundred dollars—or it may be a decision with regard to shipments to a railroad already in debt for coal to the extent of a million dollars, but in either instance, and for every gradation between, credit is a marketing problem.

And last but not the least is merchandising—finding customers whose requirements as to tonnage and quality of coal match up with the production at hand and getting the orders and contracts.

Better Marketing

The price of coal is not the governing factor in selling it, and the cost of production is not the determining factor in making the price. Save in the few instances where coal is delivered, accepted and paid for as a result of personal or financial relationship, it is sold on the basis of quality and service. The range in grades, rank and quality of coal is matched only by the varying degrees of service the distributers of coal give their customers. G. B. Gould, whose engineering experience of many years as consultant between buyer and seller of coal, gives his words the weight of authority, says in this issue that the "immaturity of the coal industry can be demonstrated in no better way than by the utter lack of relation between individual coal prices and the relative value of the various coals to the buyer." This lack of relation, he notes, is found in the market for no other basic commodity. Buyers are not discriminating and the coal trade itself is none too well informed. "If the consuming public," he says, "is not well enough informed to discriminate intelligently and accurately in matters of value, why should the producer spend his good time and money to inform himself?" Why prepare coal better if the buyer will not appreciate it?

Here is the big opportunity for better marketing of coal. It is the old, old story, followed by so many other lines of trade, of elevating the consumer's standards to the point where he is highly discriminating. How can this be done, and what follows?

In the first place the buyer must know of the multitude of variations in the quality of coal. His education today has not progressed much beyond the point where he recognizes two kinds of coal, good and bad. It is not always the highest "quality" that is best for a particular user, and this is the saving grace of the producer of lower-grade coal. Finding a use for every coal and a coal for each use is better marketing, but still better is educating a clientele to demand your coal.

Consolidation Coal Advertising

In this connection we would like to bring together and reproduce every one of the advertisements of the Consolidation Coal Co. that have appeared the past year in two popular national weeklies. If you know coal men at all you know that the copy for these ads was conceived and written by advertising experts. It is good copy, written with a faith in its efficacy foreign to the coal trade. But if persistently followed up it will promote interest in quality and service, to be followed by confidence in the product of the advertiser. Such advertising of coal is too new to have power to close sales, but that will follow. To make the prospective buyer believe that he should have a certain brand of coal and a certain measure of service is to create a demand for that coal and that service. And the more discriminating the buyer becomes the better it is for the coal trade.

It is the aim of every distributor of coal to establish his coal in a given market and for specific uses. Everyone is familiar with the concern that has made its name synonymous with quality and perfect service in New York Harbor. Another producing company has

such a firm hold on the gas business in New England that others have not yet been able to break into this market with coal probably equally good for that service. Other instances of firmly-rooted trade could be cited, all those in the old conservative East built up largely through personal selling efforts. The coal distributors in the East with the largest business, whether producers or middlemen, secured their hold on their trade before the day of display advertising as a factor in selling. They have never sold coal any way except through personal contact and have kept up the contact with direct-mail methods.

The Old School vs. the New

There is in every line of endeavor a younger generation with what it likes to call advanced ideas, against which are opposed the conceptions of the older generation—the men who built up the business and who are inclined to believe that what was good enough for them is good enough for their sons. This conflict of minds is going on in the coal trade as well.

Centering in Chicago, in a coal market as fiercely competitive as any in the world and with a tonnage second to none, is a thriving development of a new school in coal. It was there that the statistical trade bureau was first developed and where it still functions the nearest to perfect. It is there that advertising coal has made its furthest advances in this country, and that means anywhere. Some ten years ago two men in Chicago set out to put their coal in a retail yard in every city and hamlet in the dozen states that could be reached with southern Illinois coal. They sought to make the trade name of their coal familiar to every user in this territory. They backed up their salesmen with advertising without stint. As late as 1916 the wiseacres in the trade were shaking their heads over such a wild course and predicting failure and bankruptcy. But the system worked and the company, now greatly expanded, is a great success. That way of selling to retail dealers is now accepted by the Midwest trade as the only way.

Some of the younger generation in the effete East, backed by liberal-minded older men, are looking on the problem of marketing coal as being at bottom a marketing problem and are using all the tools with which to sell that other trades have sharpened to advantage. The exceptions stand out so prominently as but to emphasize the generalizations in this regard.

"Cherchez la Jobber"

A commentator on the marketing of agricultural products recently summed up the position of the middleman and the farmer with this quotation from a North Dakota farmer: "Damn those middlemen! I wish I were one!" The coal jobber is in much the same enviable position. Mr. Cushing, in response to our request for his explanation of the "Why" of the middleman in coal, has given us an admirable paper. You will find it elsewhere in this issue and you should read it. As we have always suspected, the coal jobber—we just can't avoid using the word, it is so convenient—is with us because he makes his own way; he performs a service and collects pay for it.

Many producers hold to the view that it is the jobber who is to blame for whatever ails their business. When prices are so low that you have to reach up to touch bottom, the jobber is responsible; when prices are out of hand, it is the jobber who raised them. No one has proven either theorem as yet. It takes a lot of factors to make a coal market and the middleman in coal is just one of them.

Mr. Cushing concludes that the free-lance wholesaler of coal is the fittest and declares that what is needed is more study and research into the art of marketing as he practices it. We really need a better understanding of the marketing of coal in all its aspects. Maybe Cushing is right and he who buys coal outright and then sells it is the keenest distributor, but that conclusion does not follow. As one of our contributors in this issue says "smartness" has no place in the coal business today.

A thinking jobber recently summed up his position somewhat in these words: "What I do as a jobber is to act as a buyer for the coal consumer. I study the combustion problem at his plant, decide what kind and grade of coal will give him the best service, and then I go out and buy that coal for him. I am working for the consumer. If he hired me, or someone else who knew where to buy the different kinds of coal, and how to buy coal, he would have no use for me as a coal jobber. He would deal directly with the producer. When the coal consumers learn coal, if they ever do, we jobbers will be out of jobs."

What the Maps Show

To those who say that there is no such thing as marketing science in the coal industry we emphatically say that the lack is not in the absence of selling acumen in the coal trade but in that it has never been uncovered. Words without end have been printed about the science of mining coal but almost nothing about marketing it. We produce coal better than we sell it only because we know more in a collective way about mining than about marketing.

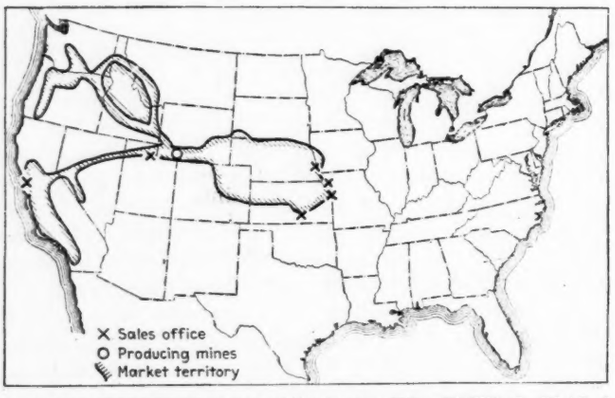
A few simple maps accompanying this text serve to illustrate a point. These little pictures show the market territory reached by three large coal-producing companies. The Consolidation Coal Co., for instance, has mines in five fields, has sales offices in thirteen cities and in this country distributes coal over twenty-four states and part of Canada. The territory embraced represents 75 per cent of the bituminous coal consumed in the United States for all uses. The story of how this coal is mined and prepared, what it analyzes and what it is good for, is an open book to anyone. These things have been described in print, but who has ever read how the Consolidation Coal Co. markets is product?

The Central Coal & Coke Co. has mines in four states, has sales offices in six states and sells coal in seventeen states. These simple facts are shown graphically in three small maps. The West Kentucky Coal Co. has mines in one field, eight sales offices and distributes coal in eighteen states. These are but three samples, selected at random, demonstrating the wide areas over which in highly competitive markets individual distributors can and do spread their product. Each overlaps the others. What is good practice in selling the coal of one company may not be wholly good for another. It is a long stretch from Omaha to Los Angeles and the Central Coal & Coke Co. doubtless has found the best way to cover that territory, and it probably is quite different from the way their Missouri coal, with a limited field of usefulness, is distributed. Even the Consolidation Coal Co. must find parallel problems

MARKET TERRITORY REACHED BY THE CONSOLIDATION COAL CO.

in its distant markets of the Central West as compared with the more highly developed industrial region of the East.

We look forward to the day when the general sales managers will be less self-conscious and as eager and willing to advance their art by interchange of ideas and methods as the engineers have become. When that happens in larger measure than today each will find that he has nothing on the other fellow, that all have certain

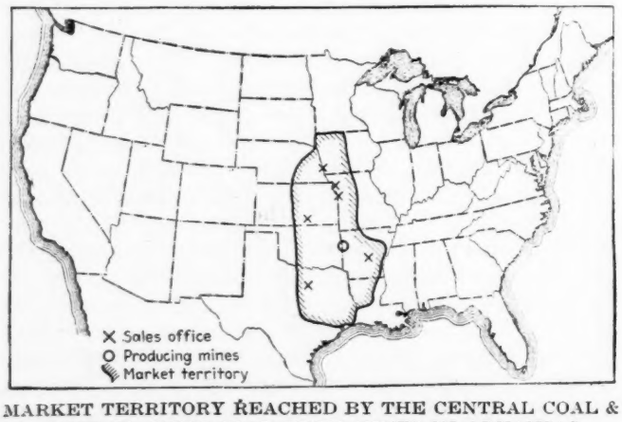


MARKET TERRITORY REACHED BY THE CENTRAL COAL & COKE CO. WITH COAL FROM MINES IN WYOMING

fundamentals and that it is in details of method and organization that selling differs as between companies.

Why Better Marketing?

There is a tradition in the coal trade that just so much coal will be bought and burned each year; consequently why make a fuss over trying to sell more? The same argument applies with equal force to mining, but, strange to say, that



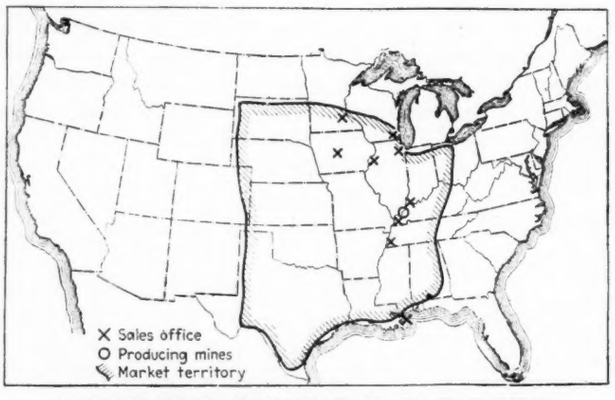
MARKET TERRITORY REACHED BY THE CENTRAL COAL & COKE CO. WITH COAL FROM MINES IN ARKANSAS

prevents no one from putting forth maximum effort to improve mining methods. The hazard to life and limb is the only serious problem of the industry, outside of relations with the unions, that is purely on the mining side. The other so-called ills flow from maladjustment in the distribution of coal—that is, are subject to correction through better marketing. Elimination of seasonal production and transportation, for which seasonal freight rates are proposed as an artificial remedy, is an example.

Without the help of seasonal rates, and despite industrial depression, some coal operators have kept their

MARKET TERRITORY REACHED BY THE CENTRAL COAL & COKE CO. WITH COAL FROM MINES IN MISSOURI AND KANSAS

mines in full operation. Their testimony is that superior selling has been responsible for this exceptional performance. Some ascribe their ability to move coal this year to the fact that they did not take advantage of their customers during the period of high prices last year. One sales agent who has kept a number of mines supplied with orders for full operation all year has described his system to us as predicated on the practice of being heavily oversold during the boom years, buying outside to fill orders, and thus coming into a period of reduced buying with sufficient business for his own output.



MARKET TERRITORY REACHED BY THE WEST KENTUCKY COAL CO.

In better marketing, in broader knowledge of finance and business, wider acquaintance with the problems of men in other industries, and more intimate understanding of their own industry, the coal men of the next decade are going to be more representative business citizens of the United States. The day has passed when a coal operator is merely a mine manager, and a wholesaler a mere trader.

Development of Better Selling Methods Dependent Upon Education of Consumer in Coal Values

Lack of Information of Relative Worth of Coals, and Consequently Lack of Discrimination on Consumer's Part, Responsible for Waste and Inadequate Preparation—Trade Misses Opportunities

By G. B. Gould*

EVERY important economic question creates a contest between two schools of thought, the regulators and the advocates of a *laissez-faire* policy. The extreme regulators seem to believe that legislative bodies can amend or repeal economic laws, but Mr. Lenine seems to have successfully demonstrated the fallacy of that extreme.

The extreme advocates of *laissez-faire* insist that legislative regulation of business is nothing but a throwing of monkey wrenches, which retards the beneficent working out of economic progress. American experience with regulation has demonstrated by its successes and failures that there is a middle road which can be safely and profitably followed.

Quack Remedies Numerous, as Usual

The coal trade is one of great public importance, and the war conditions served to focus public attention by accentuating the symptoms of a condition which existed all the time. The result has been the usual offering of patent medicines to cure the symptoms instead of the disease, and in some quarters there is a great cry for "regulation of the coal industry." In this situation it is worth while, perhaps, to give some thought to fundamental conditions. The fever and high blood pressure have subsided. The convulsions, except those artificially created by labor troubles, probably are over for some time, at least in their most violent form. Many who were the loudest in calling for heroic treatment when the fever was running high are now equally sure the disease has disappeared. If the coal trade and American industry are to profit by the lessons of the war, we should give some thought to the patient himself and his history.

If we are to see the situation straight, we must consider the consumer a part of the coal trade. What the consumer does and what he thinks are just as important as what the coal operator or jobber does and thinks. The trouble has been that most of the proposed remedies have been suggested by persons who could see only the producer or the consumer, and all of the medicine was to be taken by one of them.

Introduction of Coal Reduced Power Costs

Let us go back and sketch very briefly the history of coal in America. The discovery of coal, combined with the discoveries which made possible the application of mechanical power to industry, came rather suddenly. An industrial revolution was the result.

No matter how much coal cost, business found that power produced from coal was tremendously cheap as compared with man power in manufacturing. There was literally a scramble to put more coal to work. That was all the consumer thought about. Factories, railroads, steamships multiplied rapidly. Apparently there was an endless supply of cheap coal, and very little was known or thought about the qualities of coal or its economical utilization. Burning coal to make steam seemed like such a simple process. Engineers in the meantime were improving our prime movers. That development began to approach its ultimate economy, and progress slowed up. Competition between steam-propelled factories produced an era of intense study of ways to improve upon the economy of machines and men in using power. The waste of man-power in using mechanical power was found to be appalling, and anything like the final solution of that problem in all its ramifications is not yet.

War Directs Serious Thought to Coal Trade

Just before the war, however, thoughtful attention to the significance of coal quality and economy in the use of coal itself was in its infancy. The better production of coal and its marketing were just beginning to be seriously thought of as important factors in manufacturing cost. The coal trade really was not thought of at all until the war made us conscious of its place in American industry. It was like a man's lungs, which are practically unthought of by their owner until an attack of pneumonia makes their presence and function painfully noticeable.

The coal trade—and this includes the consuming part of it—is twenty years behind every other basic industry in its development. It is only a youngster among full-grown men. And the youngster's final development to maturity is mighty important to the men he works with. If the economic doctor tries to treat him for a disease when the trouble is only immaturity, we will create a disease instead of curing one.

Beginnings of Summer Stocking

Take the matter of seasonal demand for coal. Before the war—before the public became conscious of the need of stabilizing the demand for coal—economic processes had already set in motion by natural development a protective reaction, which was to some extent acting as a stabilizer. The summer months normally were the months of low coal prices. It is possible that, if our freight rates had not already been crystalized by a system of rigid regulation, the railroads would have long since adopted seasonal freight rates to stimulate the movement of coal in the summer. After a coal shortage, of course, the consumer suddenly saw the advisability of summer storage. But in normal times you can hardly expect coal consumers to lay in coal during the summer unless some adequate financial advantage is offered. The element of protection against

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a shortage which is not even threatened is not a sufficient inducement. Seasonal freight rates would be a sound constructive step for our legislators and regulators to take. It would be in line with economic law rather than an attempt to short-cut normal economic development.

Price regulation, on the other hand, is comparable to regulating a steam engine by hand instead of using an automatic governor. The price level in an industry like the coal trade, where it is not subject to private arbitrary manipulation by either the producers or consumers, is a most delicate automatic governor—not perfect in its operation, perhaps, but certainly superior to hand regulation by an all-wise bureau.

Arbitrary Limitation Set on Coal Prices

During the war our politicians picked out coal prices to arbitrarily limit. Low coal prices would not hurt the enemy, but plenty of coal at the right place and at the right time would. We tried to limit prices, and then by exhortation and edict increase production. We set up two diametrically opposed forces, and one had to yield. If we had not been such a patriotic and essentially law-abiding people, price fixing would have been more of a fizzle than it was. Payments of higher than government prices, notwithstanding, were notorious, until production equalled demand.

War conditions, too, accentuated a latent interest in coal quality. Again the symptom of a fundamental condition became so obvious that it could not be ignored. The consumer suddenly was awakened to the need of discrimination in buying coal, at a time when discrimination was, for the average buyer, impossible.

The immaturity of the coal industry can be demonstrated in no better way than by the utter lack of relation between individual coal prices and the relative value of the various coals to the buyer. It is like the weather—something that everybody talks about but nobody does anything about. Unlike the weather, though, something can be done to correct it. It is a condition which is gradually being corrected, but there is a long way to go yet.

Demand Lacking for Better Coal Preparation

Everybody knows what a wide variety in both character and quality of coal is produced in the Northern Appalachian fields. Most of these coals have a legitimate market, at a price. Much of our coal would be better prepared if there were any strong economic reason for that better preparation. Take any lot of coal bids made simultaneously anywhere in the New England or the Middle Atlantic States to the same consumer.

If these bids are studied in the light of the relative value of the different coals offered, the prices will be a jumble. In a recent case of twenty-two bids the prices quoted for coals of substantially the same value and of the highest grade ranged from $2.40 to $4.15 a ton at the mine. For the other coals, known to be lower grade, the prices varied from $2.45 to $3.40, the poorest coal of the whole lot being quoted at $3.40.

If this were an isolated case it would prove nothing, but this situation is typical of normal conditions, either before the war or since. Some of this variation, of course, is due to individual differences in the internal conditions of the producing companies, somewhat to the standing of those producers, and to the extent to which their reputation and that of their coals is known. That difference will always exist and is a legitimate factor in price making for any product.

It is not this lack of relation itself but the fact that it exists which is important. Such a condition does not exist in the market for any other basic commodity. Who is to blame for it? It is the result of the evolution of the coal industry, and natural to its present stage of relative youth. The consumer is generally uninformed as to values, and consequently is indiscriminating. If this were not true the producer of an inferior grade at a relatively high price would soon go out of business. The very fact that such a condition exists generally proves that he does get away with it often enough to stay in business.

And the coal trade, taken as a whole, is not any too well informed as to actual values. And why should it be? If the consuming public as a whole is not well enough informed to discriminate intelligently and accurately in matters of value, why should the producer spend his good time and money to inform himself? Why should he spend his good money to prepare his product better, when his customers are not discriminating enough to appreciate it?

Exceptions Prove Industry Is Making Progress

Perhaps, you answer, "Oh, but this is not so." You can name a number of coal producers who have been conspicuously successful by producing uniformly high grade coal, and get consistently prices above the market. "Somebody must appreciate their efforts to produce better than average coal." That is true, too, but here you are offering as an example a very small part of the coal industry, which in turn supplies the smallest and most discriminating section of the buying public. The very fact that there are such exceptional cases shows that the industry as a whole is making progress. The consuming public is, without doubt, becoming gradually better informed and more discriminating, and coal production is being influenced by it. But the fact remains that the coal market today is still dominated by the indiscriminating buyer.

There are some who advocate standardizing coal quality by law. When one considers the infinite variety of factors which in the long run determine both the average level of prices and relative prices, and when one considers the almost infinite variety of coals, such an attempt will, in the opinion of the writer, result merely in another case of economic meddling, or muddling, as you choose.

Adjustment Quickly Follows Public Demand

The individual consumer can become informed and discriminating. As a larger and larger part of the buying public awakens to the importance of it, the coal producer will adjust himself to the more discriminating demand. That is inevitable. Those who have been in a position to observe this development can see a distinct measure of progress during the last fifteen years, in spite of the interruption to it caused by the war.

For a healthy coal trade we need not more regulation but more education, most of it self-education, both in the ranks of those who produce and sell coal and those who buy and use it. Anyone who advances the cause of more reliable information about coal, more widely distributed, promotes the best interests of the coal trade as a whole and those of American industrial success.

Will Reformation of the Coal Industry Proceed From Forces Within or Without?

Control by Mine Labor Affects Mine Costs and Sales as Well as Quality—Progress at Mine Through Labor-Saving Appliances Fails to Keep Pace with That of Coal Consumer

By Eugene McAuliffe*

BIOLOGISTS say that our physical bodies undergo a complete change every seven years. The forces of nature work silently, continuously; we barely sense the change that takes place. In worldly affairs similar changes take place; natural forces work unceasingly for change. The old order goes; a new one takes its place. The coal industry is no exception. Together with all other lines of business endeavor it was caught up and whirled over, under and about in the cataclysm of the world's war.

Prior to the war the industry occupied a relatively modest place in our affairs; coal was plentiful and cheap, a shortage was unknown, transportation charges were low, an 80-per cent coal stood with many consumers in the same social atmosphere as that occupied by the 95-per cent article. Then came famine—lack of transportation, shortage of fuel, banked fires, fuel rationed to thousands, who learned for the first time that King Coal was a star of the first magnitude. Coupled with shortage came mounting wages and transportation costs, labor for handling coal and ashes was scarce and high, and out of all this is coming, slowly, a new and broader conception of the magnitude of the industry. Today the nation's thinkers—its writers—are giving thought to the coal industry; the columns of magazines, never before opened to coal—the *Atlantic Monthly* and *World's Work*, recent examples—contain papers, essays, studies bearing on this now important subject; Atlantis-like it is being treated as a newly discovered continent. The industry is changing; the question is, will it change from forces within or from forces without?

Railroads and Coal Industry Closely Related

There is a very close relation between the railroads and the coal industry; they are, in fact, insolubly related. The railroads have felt the pressure of outside forces for twenty-five years. Will the same forces envelop the coal industry or will it put its own house in order? Keep the fact before you that the old order is constantly shifting.

The Constitution of the United States stood unchallenged for many years; then came amendments, some of which spoke in a minor key, others, like the thirteenth, which abolished slavery, roared out in deep diapason, a voice that overwhelmed the theory of property rights that opposition to slavery was based upon. Then came that other great amendment, the eighteenth, which likewise struck at the reintrenched theory of property rights, and millions invested in distilleries and breweries were compelled to seek new fields of endeavor in a night and the highest court of the land restated the age-old principle that the rights of the individual must yield to the welfare of the many. Another great change, one that came in quietly, was the nineteenth amendment, which enfranchised the womanhood of the nation, and so I again ask: Will the coal industry change itself from inside or will it be changed from without? What should be done to improve the existing status? Get the facts. They must come from an authoritative source.

Public Fed on Misstatements About Coal

The true province of government is to educate, not alone the youth but the mature. If the government will get the true facts regarding any industry before the men in control of that industry these men will move in the right direction. The public is saturated with misstatements regarding coal—a new avalanche of partisan untruths will be spilled out while the new wage contracts are being worked out after Jan. 1. Today the papers are full of the West Virginia situation. Union leaders have hurled tons of high explosives at the men who operate the mines in that section, charging everything from starvation and peonage to murder. The operators in reply assert truthfully that their loyal labor saved the country from freezing during the great strike in November and December, 1919. They show wages to individual miners in these non-union fields as high as $500 per month, and in substance attribute the West Virginia war to the frantic desire of paid union leaders to perpetuate their meal tickets. It does not, however, seem to occur to the West Virginia coal men that the facts once obtained and published would dissipate the fog of crimination and recrimination that obscures and will continue to obscure the atmosphere. To obtain and make known the facts would do the turn as effectively as the presence of U. S. troops.

Mine Labor the Overshadowing Difficulty

This leads to the thought that back of all the difficulties that beset the coal producer and coal consumer is that overshadowing one, mine labor. Outside of a few restricted areas it controls and dominates the coal properties. That control reaches into the very vitals of mine operation, mine costs and sales, together with quality. The installation of mining machinery to reduce costs and improve quality has been fought by union labor from the beginning. For example, shortwall mining machines have been kept out of mines for years because of the failure to agree on a tonnage rate; so it has been with permissible explosives. Seldom are these problems approached in an open-minded manner, but rather with the antipathy shown by English farm laborers to the threshing machine when it came as a successor to the flail.

The coal industry of this country is now ripe for loading machines, but at the present rate of progress it will be twenty years before they come into use. While the

*President, Union Colliery Co., St. Louis, Mo.

consumers of coal have perfected and installed fuel-saving appliances—the automatic stoker, superheater, economizer, the condensing turbine—thus reducing the unit of consumption of coal, mine labor is loading a poorer grade of coal than it did twenty years ago, and poor coal means loss—loss compounded with each movement it undergoes from the mine face to its final resting place in the ash heap. Tests recently made by a large public utility where the delivered cost of coal is $6 per ton showed the following comparison of values:

Percentage Moisture	Percentage of Ash	Delivered Cost	Delivered Value	Loss, per Ton
4	10	$6.00	$6.00	....
4	12	6.00	5.80	$0.20
4	14	6.00	5.58	.42
4	16	6.00	5.32	.68
4	18	6.00	5.01	.99
4	20	6.00	4.64	1.36

The compelling duty that confronts the coal industry today is to obtain the facts about itself—self-study, introspection, a resolve to use the facts as a guide for business improvement. It must regain the management of the mines it owns and operates, and when regained it must manage them with justice to labor and to society at large, failing in which the history of the American railroads will be repeated in the coal-mining industry.

Knowledge and Persistence Chief Requisites For Successful Marketing of Coal

BY HARRY F. NASH*

AN OPERATOR and his sales force should know their article thoroughly and then persistently present to the trade, in various ways, the superiority of their product and endeavor to educate the dealer to continually keep after his customers to store coal when it is plentiful, pointing out to them that by so doing they can obtain a better article at a less price.

I believe that the general sales agent of any coal company, and all of his traveling representatives, should spend considerable time at the mines—both inside and outside—in order to familiarize themselves with all conditions pertaining to coal mining as well as preparation. It also is well for the sales force to acquaint themselves with the quality and preparation of the coal sent out by their competitors. In this way they are able to answer the dealer's battery of questions intelligently. Persistence, in my opinion, also has a large part to play in the successful selling of coal.

The salesmen of an operating company should remember that it is "the man behind the counter of the retail office" who largely influences prospective purchasers as to what kind of coal they buy. The retailer should be acquainted with the fact that, in order to make lump coal, the operator must screen his mine-run coal into various sizes, such as lump nut, pea and slack, and that he (the retailer) must do his part in so far as taking his proportion of the smaller sizes that result from screening the lump.

The retailer should then endeavor to sell his customers not lump coal alone but nut and the other sizes as well. He will be doing the domestic consumer a favor by urging that he take some nut coal as well as lump—the nut coal can be burned more advantageously in kitchen ranges and small heaters than can the lump. If a consumer has both a furnace and a cook stove but buys nothing other than lump coal, he must in many cases break up the lumps in order to get the size of coal that will go into the firebox of the cook stove. This makes a great deal of slack and wastage for the consumer, so that a dealer who thoroughly understands that an operator cannot ship him lump coal only can, by instructing his sales force, easily sell his customers the smaller sizes of coal as well as the larger. In our territory we have one town of about 40,000 population where there is more nut coal than lump sold, and this is due solely to the fact that the retail dealers there have educated their customers to burn the smaller sizes of coal. The same thing can also be done in other towns.

The marketing of coal is such a huge subject that pages could be written about it, but I believe the salient requisites for successful marketing can be combined in the words "knowledge" and "persistence."

*Vice-president and general sales agent, Oakdale Coal Co., Denver, Col.

Finds Hard Work and Co-ordination Only Means of Success in Coal Selling

BY CALVIN HOLMES*

OUR MINES in the Kentucky fields have been able to run 100 per cent since Jan. 1, 1921, and we are now on about an 80 to 90 per cent basis in the Tennessee field, in spite of the fact that our Tennessee coal is thin seam and very costly to produce and that we have to get a tremendous price for it even to break even with the present wage scale we are paying the coal diggers.

As for any particular selling argument, I am sure that I really could not pick out any one thing that has led to our being able to obtain orders. So far as my experience goes there is no royal road which can be used by the sales organization of the country to achieve success. I believe that our ability to run has been based upon co-ordination of effort more than anything else.

At our mines the production department carefully watches the preparation and the cleaning of the coal.

In our shipping department we do our best to ship the coal as agreed upon, never shipping an order in advance and never allowing a date on which a car is due to move to get by us without making shipment if it is humanly possible to get the coal out.

Last of all, our road organization and our office follow-up organization have simply worked and worked hard and when they got tired of working started over and worked some more, so we cannot claim any particular argument or efforts that any other selling organization has not either used or tried to use.

*Vice-president in charge of sales, Blue Diamond Coal Sales Co., Cincinnati, Ohio.

NATIONAL SAFETY COUNCIL.—Owing to the space accorded to the Huntington meeting, it was necessary to delay publication of the account of the National Safety Congress till after the "Better Mining and Marketing Number." Frank H. Kneeland covered the meeting quite carefully and will record what took place in the issue of Oct. 20.

COAL COMPANY CUTS WAGES AND MEN STRIKE.—On Sept. 16 the Emmons Coal Mining Co., at Marion Center, Indiana County, Pa., put the 1917 scale in force. The miners on Sept. 14 had declined to accept the cut, but reported for work as usual after the cut was made. The company promised steady work if the scale was accepted but on Sept. 23 the men, on presenting themselves at the mines as usual, declared that they would not work for anything less than the standard scale. The mines will, therefore, remain closed till April 1, 1922.

In Selling Coal, Price Is Not the Governing Factor

Independent Wholesaler Thrives Despite Unfavorable Conditions and Public Obloquy — Salaried Salesman Prone to Measure Energy by His Income—Better Marketing Must Be Based on Service

By George H. Cushing*

PRODUCTION methods in coal have been studied until there are only two major methods. Each is good, has its adherents and is improving monthly in detail. However, we know so little about what is the best way to market coal that we have hardly a starting point. And yet it is through the marketing of coal that we make the contact with the public and form public opinion. This makes it the biggest subject before the trade.

I will not indulge in definitions even though I must draw distinctions. There are in the coal trade no scalpers, no brokers and no jobbers. Those terms, which apply accurately to dealings in theater tickets, in stocks and bonds and in many other industries, have no meaning in the coal business. In coal we have the producer and three groups of distributors distinguished from each other only by their methods of collecting their compensation.

The real producer knows that he cannot be in two places at once. He cannot be at the mines and in the market. If he tries both he must sacrifice effectiveness in both directions. Therefore the real producer does not try to market his own coal. He hires someone to do his marketing. That gives us the three groups of distributors—those who hire out on a salary to the producer, those who hire out on a commission and those who buy coal outright and take a chance on getting more than they pay. I call these three distributors the controlled sales force, the agency and the wholesale merchant.

Three Agencies Distribute Equal Tonnage

It is next to impossible to compile any figures which will measure even the relative importance of these three forces to the coal trade. I have tried it. The figures are practically worthless. Such inquiries as I have made—and they have been quite extensive—lead me to believe that each of these organizations distributes about one-third of the coal. On a tonnage basis I believe they stand about equal.

In what follows I want it understood that I am merely reciting facts which I have observed. I am not pleading the cause of any one group. I am merely searching for the truth in the light of those facts which are available. Certainly, I want it understood that this is not association propaganda. The membership of our association comprises all three classes of selling organization and we hope to have more members of each kind. Our association, as a matter of fact, accepts anyone who is a merchant regardless of how he is compensated for his services. The character of the man is the standard of measurement with us. We pay no attention to his method of compensating himself.

Looking at the matter squarely as an abstract problem, I have been struck by these facts:

In 1918, when the coal industry was controlled by the war machinery, the opinion was that the independent wholesaler was a parasite. He was allowed to function only if he could collect a higher price than was being charged by every other coal salesman. Yet never did the independent wholesaler do so much business.

In 1920, when prices were the highest on record, the independent wholesaler was accused of withholding coal from sale for speculative purposes and he was openly accused by the government of indulging in frequent resales of coal for the sole purpose of advancing prices. Yet in 1920 the volume of business done by the independent wholesaler was far greater—with a smaller total tonnage—than it was even in 1918.

Independents Got Most Foreign Trade

In 1920 the coal industry did a big business abroad. Orders were being sought by all three groups of distributors. Many producers have told me—and the figures confirm the statement—that the independent wholesaler got the bulk of the foreign business and the best prices.

This record goes directly contrary to popular beliefs and public ideals. If one judged by what the newspapers and the government officials are always preaching, he would say that "everyone wants to buy direct from the producer, therefore the controlled sales force must do the most business. When the controlled sales force is 'cleaned out' the overflow business must go to the sales agency which directly represents some mines. What business is left probably would go to the independent wholesaler. One would judge that the latter's share would be small."

When one finds that the facts are exactly contrary to this interesting and logical hypothesis he has to stop and revise his theories as to what is the best method of marketing coal.

Obtain 15c. Per Ton Above Government Price

I admit that I was amazed to learn — after having believed to the contrary for years—that the price of coal is not the governing factor in selling it. However, that point was proved beyond a peradventure in 1918 and again in 1920. The mine price in 1918 was advertised broadcast by the government. Everybody knew what it was and that he could get coal at that price at the mines. Dr. Garfield even went so far as to establish public distributing agencies at the offices of which the people could buy coal at the established mine price. In that year, and despite direct government competition the independent merchant did the biggest business in his history and got 15c. a ton more than the government's mine price.

In 1920 the newspapers and government officials advertised to the world their belief that the independent wholesaler was making a profit of $2 a ton or even more. Yet, despite this adverse advertising, he did more business than in 1918. This peculiar success must be explained or we will never get at the best method of mar-

*Managing director, American Wholesale Coal Association.

keting our coal. I am *coming* to believe that the secret of this success lies *in the method compensating* the distributor. If that is the deciding factor in getting a good marketing system, we can well afford to study that matter carefully.

So long as potential production is so much greater than actual demand, the producer of coal is up against the keenest kind of competition. To sell his coal, he must put every ounce of energy into his solicitation of orders.

What system of compensation will give the salesman the most energy and the producer the largest volume of orders?

Salesman Prone to Rely on "Regular Trade"

The controlled sales force gives, of course, the lowest cost of sales. But human nature is inclined to "sleep on a contract." Also the salaried man is likely to measure his energy by his income. If his salary is small, his efforts are likely to be weak. Besides, the controlled sales force is disposed to act today in a way to make sales easy tomorrow. That policy may "hold customers" but it does not expand much. This method of marketing coal tends to make the salesman rely too much on his "regular trade." It fails to give the controlled salesman the necessary resource when part of his safe and sane market fails him. The controlled sales force has, therefore, elemental weaknesses.

The sales agency is in a far stronger position. Its outstanding virtue is the fact that the more business it does, the more money it makes. That inclines to add "punch" to its selling efforts. Also, the higher price it gets for the mine, the more money it makes for itself. That tends to make the sales agency fight for good prices. Another virtue to the producer is that the sales agent is "his man." The ethics of the trade—understood but never expressed—provide that when an agency undertakes the sale of the output of a mine, that mine shall get the first call upon its energies and upon the order which it receives.

If we were considering this question of marketing from the standpoint of the coal man alone, it would, on the face of these returns, be decided that the sales agency was the ideal form. However, the sales agent is, himself, not satisfied with the 8 per cent or the 10 per cent commission when prices are going up. And, the operator is not satisfied to pay the 8 per cent or the 10 per cent as a sure margin to the agency when prices at the market are less than the cost of production at the mines. That is a defect in the system which makes it necessary to revise the terms of the agency agreement if we are to keep the other virtues which are inherent in it.

Independent Coal Man Takes Gambler's Chance

There is something in the frankness and the boldness of the independent merchant in coal which gives him a special appeal to the American people. He buys coal outright at the mine, and then tries to sell it at a profit. Everyone knows that he has a big chance to lose heavily. It is equally well known that he has a gambler's chance to make a handsome profit. Whether he wins or loses must depend solely *upon his individual efforts.*

The fierce struggle to win against heavy odds adds a mysterious something to his appeal to the customer. Certainly it adds a very material something to *the service which he gives the buyer.* From that buyer he is going to get the pennies or the dollars which must measure his profit. He must, somehow, contrive to prove to that customer that he earns that money.

In 1918 the independent wholesaler earned his bit by taking the place of the buyer in the struggling line before the office of the producer and by getting the much-coveted coal. In 1920 he did the same thing and then added a definite service—he fought the government and the railroads to keep them from confiscating his coal. If the coal got away from him after all, he plunged back into the struggling line again and got more.

In normal times he does less spectacular but equally valuable things for the buyer. Always, however, the independent wholesaler must give a service which convinces the buyer that it is worth the money he pays for it. The virtue to the producer in this arrangement is that he sells the coal at the mines. From that minute all uncertainty has gone. He is left free to do his job of producing. Often he even gets his money in advance.

The demerit of the independent wholesaler—viewed from the standpoint of the producer—is that when buying he is inclined to be a "bear" on the market. He is shrewd. He knows the market. He is persuasive, for that is the way he makes his living. He can talk a monkey off a grapevine. If you turn that sort of a glib animal loose upon an unsophisticated operator, the latter is likely to suffer injury to his pocketbook nerve. In fact, the whole objection to the independent merchant is that he is too good as a buyer.

We do not as yet know anything much about good marketing methods. But, on points, it looks as if the controlled sales force has the least to recommend it. The agency—if its commission is revised—is good. The independent merchant has a striking appeal. If that rests on the fact that he gives what the buyer wants and is willing to pay for—service—we are not going to get better marketing methods until we have all taken a post-graduate course in that branch of selling.

Federal Reserve Board's Foreign Trade Index Reflects Advance in Prices

THE Federal Reserve Board's index of the value of August exports and imports of selected commodities at 1913 prices follows. This index is designed to reflect the movement of foreign trade with fluctuations due to price changes eliminated. The list of commodities used includes 29 of the most important exports, the value of which in 1913 formed 56.3 per cent of the total export values, and 25 of the most important imports, the value of which in 1913 formed 47.7 per cent of the total import values. Both exports and imports have been further classified into raw materials, producers' goods and consumers' goods. Index numbers for July are shown for purposes of comparison.

EXPORTS

	Raw Materials 12 Commodities	Producers' Goods 10 Commodities	Consumers' Goods 7 Commodities	Total Exports 29 Commodities
July, 1921.....	111.6	68.3	131.8	112.5
August, 1921. ..	142.5	68.1	164.1	140.9

IMPORTS

	Raw Materials 10 Commodities	Producers' Goods 12 Commodities	Consumers' Goods 3 Commodities	Total Imports 25 Commodities
July, 1921.....	99.3	126.5	114.9	111.4
August, 1921....	116.7	164.8	126.3	135.7

(Index numbers: monthly average values, 1913 = 100)

THE WAY THE AVERAGE CITIZEN looks at the Mingo situation: There's always **something** to make coal cost more.—*New York Sun.*

To Make Each Sale Mutually Advantageous to Buyer And Seller Should Be Goal of Coal Distributors

BY ONE OF THEM

THIS is the moulting season for coal men. The more far-sighted are casting off the thick cuticle of "war years" and are taking a fresh start, for the year 1922 is certain to provide a broad field for thoroughly-equipped distributors. With readjustments continuing to face us and the pressure to restore the old equilibrium between different routes, the wholesaler especially will be obliged to keep closely advised of traffic changes that may have vital effect on established practices of the trade. Much more than in the years prior to 1917 coal will call for resilient and teachable minds, for none is more quick than the trained buyer to discover where is the dependable service and advice he needs, if he is to compete with rivals in the same bailiwick. In a word, the distribution of coal has become a specialized and technical calling which is not mastered in a few months, and the prudently kinetic salesman is the one who everlastingly keeps informed.

INTEREST OF BUYER MUST BE CONSIDERED

From a broad viewpoint no sale amounts to a copper unless the advantage is mutual—unless there is a service to the buyer as well as to the interest the seller represents. There is less and less room for just "smartness"; and the young man who takes a really long shot for the future will offer market opinions only after mature examination of current conditions and due thought also for his customer's special situation. The old notion that one need only be a "good mixer" lapsed long ago; the beckoning is to those who "take pains" along with their transactive ability and genuinely perform the service for which they are employed. If every member of an organization, from office boy and stenographer to manager and president, could regard himself as "salesman," due regard, of course, being paid by each to his routine duties, it is easy to see how there could be a straightening up; a "heads-up, eyes-front" attitude, all along the line. There is diffidence where there ought to be alert interest.

Customers are born to be catered to, as we all understand, but in his own best interest each can be made to fit into his proper place in the co-operative chain that should bind mine worker and consumer alike, and no intelligent sales manager will be niggardly about items of expense that are at all in proportion to the desired end. Telephones and mileage charges are trifling when there is yearly tonnage to be obtained—and *kept!* There is virtue in continuity.

Not only should the buyer be led to consult his "supply agent" at each significant change in his local situation, but the agent in his turn ought to be unremitting in furnishing bits of pertinent information, and furnishing them *first.* Individual and personal letters, well expressed and judiciously written, are abundantly worth the energy expended. A good stenographer, given the right kind of dictation, is worth more than all the cyclostyle mimeograph impediments that could be bought for several times her annual stipend. They have their uses, but not in selling coal where there is any individual relation with the customer.

Clear, readily accessible and complete records of orders and deliveries are of much value. Never must there be omitted any pertinent detail, for the prompt answer will often mean an order. Tariffs also must be at hand for instant use, for there again is a factor often vital in making sales. And not to be neglected is a certain relationship with representative officials of the carrying lines, based on mutual desire to be of service.

A really painstaking coal man does more than this. He keeps in personal contact with each process and step in mining and shipping, and, further, he keeps in touch with trade served by his competitors. He can never be sure some emergency may not arise when he can be of such assistance to a buyer as may earn for him a lifelong customer. No matter how strong is the vital organization there may always be recalled the dictum of Theodore N. Vail, the record of whose career Albert Bigelow Paine is now putting through the press. It was characteristic of Vail, we are told, to resolve his rivals "into individual units—each a faulty and none too resolute human being; it was a policy he never saw reason to abandon."

Besides these incidental and minor attributes of "marketing" there are certain cardinal and fundamental, if old-fashioned, obligations of integrity that no coal man can ever afford to ignore. If he would serve his customer with a view to continuing that service it would be desirable to tell the truth when he speaks and to be possessed of a lively appreciation of moral values.

When Mr. Hoover tells the world that marketing of coal is unscientific, wasteful and a breeder of calamity isn't this the season for a downright, determined effort to improve methods? The coal trade needs a tonic before the public will share our belief in it as an honorable calling.

Coal-Mine Fatalities Drop During August With Lower Output This Year

REPORTS by the U. S. Bureau of Mines show that 141 men were killed in and about the coal mines of the country during August as compared with 203 killed in the corresponding month in 1920, a decrease of approximately 31 per cent from the fatality record of August of last year. Based upon an estimated output of 42,191,000 net tons in August, 1921, the fatality rate is 3.34 per million tons produced. The rate during August last year was 3.57 and the production of coal was 56,935,000 tons.

The average number of lives lost during August from 1913 to 1920 has been 219. The production of coal has averaged 52,209,000 tons, showing a fatality rate of 4.19 per million tons for the month of August during the past eight years.

During the first eight months of the present year 1,290 men have been killed by accidents at coal mines, against 1,489 killed during the corresponding months of 1920, a decrease of 13 per cent. The output of coal for the same months was 322,060,000 net tons in 1921 and 412,109,000 tons in 1920, a decrease during the present year of 21.9 per cent. These figures represent a fatality rate of 4.01 per million tons mined in 1921 and 3.61 per million tons mined in 1920.

Framing of a Serviceable Form of Binding Contract a Vexing Problem of the Coal Industry

Demand and Energy Charge Clauses of Electric-Power Contracts Suggested as Models Adaptable to Coal Industry—Honest Buyers Protected Against Losses Incurred on Shipments to Unscrupulous Purchasers

By Carl Scholz*
Charleston, W. Va.

MANY coal contracts which were entered into in good faith by both sides during the last eighteen months have proved to be mere scraps of paper. The theory of contracts is that both parties thereto are acting in good faith and that mutual advantage will result therefrom. Some contracts, however, are broken the moment it develops that they are not as advantageous as had been expected, or when because of changed conditions they have become a distinct disadvantage. Very few people will make a bad contract twice, and this may be the reason that there are, perhaps, less contracts for coal today than last year. This argues for a revision of the basis of making contracts. The right kind of a contract is a distinct advantage to the mine operator, because it insures a dependable market, as well as to the purchaser, because it furnishes a dependable source of supply. As a whole, the coal contracts of today contain very much the same features that existed a decade and more ago. If the contract is made during a sellers' market, conditions are imposed to which the buyer would not consent if the tables were reversed.

Peculiar Complications Beset Coal Business

The marketing of coal presents complications which exist in very few other lines of business, and on that account it may be practical to search for a manner of contract which will fit the particular conditions existing, because in the end that seller will prevail who makes an equitable and fair contract and carries it out and the bargain-driving sharpster will sooner or later find himself out of business. The coal market is affected by conditions which at times impose a distinct hardship upon the operator who has contracted all or a part of his output, conditions for which he is not responsible and which he cannot obviate, such as car shortage or labor troubles. Similar situations may beset the buyer and the plan suggested herewith may work out in perfect equity to both sides on a coal contract because it has proven fair to the purchaser and consumer in other lines. Reference is made to the form of power contracts entered into between the manufacturers of electrical energy and purchasers thereof. A great many coal companies buy power and are familiar with the form used, but, perhaps, not many have considered that this contract form may be applied to the coal industry.

Charges Divided Into Two Classes

Power contracts provide for two separate charges: the demand charge and the energy charge. The primary, or connected load, charge covers interest on the power plant overhead, depreciation, sales expenses and other fixed charges. This primary charge, once established, represents a part of the monthly bill which is rendered, whether power is consumed or not. The second item, commonly known as the energy charge, covers the current actually furnished. The items entering into this charge are supposedly the cost of fuel, wages and actual operating expenses. In a well-operated and properly-installed power plant, working under normal conditions, the primary charge is about one-half of the total power bill.

The advantages of such a form of contract governing the sale of coal appear obvious, and the plan seems quite feasible in this business. Assuming that both sides to a coal contract desire to make the best possible working arrangement, let us consider the possibilities of a demand charge in coal contracts.

The same items which enter into the operation of a power plant are found in coal mining. Those items of the cost of maintaining a mine in temporary idleness, depreciation of plant and equipment, maintenance of roadways and haulage systems, pumping, taxes, insurance and a multitude of other items are in the aggregate quite large. In fact, they often represent a figure so large that many times the operators of coal mines choose rather to operate the mine at a substantial loss than to leave it idle.

Adapting Power-Contract Features to Coal

It is possible from an accounting and engineering standpoint to evaluate this cost in each case and to fix it at so much per ton for a given full-time capacity. This item, let us say, is found to be 75c. per ton.

Let us further assume that the contract price agreed upon is $4 per ton and that deliveries are to be 10,000 tons per month, which we will further assume is the total output of the mine. The buyer would accordingly pay the first of each month 75c. per ton on 10,000 tons, of $7,500, and as the coal is shipped he is either credited with 75c. a ton and billed at $4, or simply billed for the tonnage at $3.25. If, however, for some reason the buyer elects to have shipped to him but 5,000 tons, or even none at all, the producer is protected in his fixed charges and loses but the profit on the coal not shipped.

It is obvious that such a contract must provide equal protection to the buyer or it is not equitable, and hence not a contract. It must be provided that the buyer can get his 10,000 tons each month, and presumably the shipper must be allowed to furnish other coal of like grade and quality if his supply fails. Provision might be made to protect the consumer, in the event of failure to ship the coal, by the payment of commensurate damages.

Many details remain to be worked out and objections

*Vice-president and general manager, Raleigh-Wyoming Coal Co.

to be overcome, but I believe that the idea is sound and can be worked out to the mutual advantage of both parties to coal contracts.

Many changes have been made in the past in the manner in which other commodities are sold. Lumber, steel and food, for instance, are all shipped draft attached to bill of lading, and in some of the Southwestern states the entire output of many coal mines is sold on this basis. When this practice was inaugurated everyone discouraged the possibility of putting it into effect, but the practice has prevailed for many years, and has proven of advantage to the honest buyers. Under the method of selling coal on open accounts, so many losses were incurred that the operators felt they had to charge those who paid their bills for the losses incurred on shipments made to dishonest or unscrupulous buyers.

The application of this form of coal contract presented itself to me quite forcibly during the winter of 1920-21, when inactivity resulted in the closing of many industrial plants. Some mine operators who had felt secure for several months to come, suddenly found themselves without any contracts, because consumers' businesses were either curtailed or entirely closed down. In one instance, I recall, a coal operator who had 60 per cent of his coal covered by contract with a responsible concern was asked to curtail shipments. He took the position that the coal was sold under a bona fide contract and must therefore be accepted.

The buyer, however, finding that he could not use the coal, asked the operator to sell his contracted quantities on the market and charge the consumer with the difference between the revenue obtained and the contract price, and this was done. The coal operator soon discovered that in throwing this coal on the market, though but about 10 per cent of his output, he promptly established a price for the remaining 90 per cent which he mined, and that the price was lower than he considered the coal to be worth. Unconsciously this operator had entered into an arrangement of "dumping," which is most detrimental in any sales policy.

Times will come again when the operator will be asked to curtail shipments because the contracted quantities are not being absorbed. I would like therefore to advance this idea in selling coal because now is the time when it can be discussed without hurry or passion. Better marketing demands a better form of coal contract. Will this form be an advance?

Purchasing Agents Question Feasibility of Contract Advocated by Carl Scholz

By R. S. Wallace*

COMMENTING on Mr. Scholz's article entitled "Framing of a Serviceable Form of Binding Contract a Vexing Problem in the Coal Industry," I will say that the proposed form of rate does not in my opinion furnish the answer to the "vexing problem." As I understand it, the problem is to make your contracts so that they will, throughout their term, prove satisfactory to both parties.

The price stipulated is not the only essential element of a satisfactory contract. Many other factors enter into such a contract. The fact that a customer has agreed to pay to the operator a fixed sum per month plus an additional sum, based upon the amount of coal supplied to him, will not, in my opinion, make a contract satisfactory to both parties or insure its being carried out. A contract in which the price is stipulated in the manner described by the author may prove just as unsatisfactory to either party as would a contract in which the price is based entirely upon tonnage.

While the character of the coal-mining business may be such as to justify a coal price or rate based upon demand as well as tonnage, it is in fact quite similar to many manufacturing operations, all of which are essentially different from the public-utility business, in that none of them is a natural monopoly. They are not like the public utilities, confined to a definite territory.

The coal mine ordinarily has no physical connection with its customer. The customer's demand on the coal mine is within control of the operator, while his demand upon the public utility is entirely within his own control and requires only the closing of a switch to make it effective. The utility is a regulated monopoly which is required by law to furnish service to all within its prescribed territory, without discrimination, at the legal rate. The coal operator is free to deal with whom he pleases, at prices that may be mutually satisfactory regardless of prices or conditions controlling his transactions with others. While the coal business remains competitive, the operator's prices, rates, terms, etc., will be largely governed by those of his competitor. I cannot see that the "demand rate" as the basis of a coal contract will be of any considerable assistance in making coal contracts mutually satisfactory.

* * *

Graham Davies, purchasing agent of the Louisville Gas & Electric Co., Louisville, Ky., believes that "from the coal operators' standpoint the form of contract proposed by Mr. Scholz would be very advantageous but if contracts under the old form were not complied with and were considered, as he says, "mere scraps of paper" when it was to his advantage to repudiate it, we do not believe that even this new form would be lived up to by either party.

"Of course, legal proceedings might be resorted to, but were this done there would be as much probability of the old form of contract being upheld as this proposed form. We do not believe that many operators would take a breach of this contract into court owing to the effect such actions would have upon their business in future."

* * *

A New England Buyer of gas coal writes this opinion of coal contracts:

"It is very easy to comment, also very easy to criticise, but from the writer's experience in past years with both buyers' and sellers' markets, conditions seem to be the factor that governs, and it is the writer's opinion it would be next to impossible to draw up a contract that could not be broken, provided one of the parties were inclined to break it.

"The writer's judgment would be to deal with the best people to be found and then it matters very little what you have for a contract. To be frank with you, I have very little faith in contracts with the majority of coal shippers. I formed this opinion from the experience I had during the war period, but if some contract could be drawn up that would bind both the seller and the buyer alike, and we were sure it would hold, it certainly would be a fine thing, but, as stated above, I have some doubts."

*Vice-president and general manager, Central Illinois Light Co., Peoria, Ill.

Accurate Information on Coal-Production Costs of Prime Importance to Operating Department*

Expensive Mining Division a Fruitful Field for Cost Cuts—Sales Department Must Know Price Required to Avoid Loss—Finance Reports Indicate Use Made of Data by Foregoing Sections

By R. W. Gardiner†

UP UNTIL a few years ago the accounting systems of the majority of the coal operators of this country were extremely crude, and in many cases practically worthless. Very few of the smaller operators knew what it cost them to produce coal. They did not know whether they were making money or losing money until the end of the year, and then only by the increase or decrease in assets over liabilities. Unfortunately, in a great number of instances the liabilities were greater than the assets, and as a result a large proportion of the coal companies of this country have gone through some form of financial reorganization. Up to about 1916 the majority of them were practically in the hands of their bankers. They had to have money to meet payrolls, and in order to get money they had to sell coal. As a result, the buyer in many cases got the coal at his own price and on his own terms.

Another idea prevalent among the operators in those days was that it was cheaper to run at any price than to shut down. It unquestionably is true that there is a certain amount of expense in connection with closing down a mine. This expense depends largely on the amount of pumping that has to be done, the amount of ventilation, physical conditions such as bad roof, the supports of which must be looked after constantly, and similar items. If this expense of closing down the mine temporarily, which has been estimated to vary from 10c. to 40c. per ton on the average daily output, is greater than the loss per ton incurred by running and selling at a low price, then it is less costly to run than to close down. The class of operators referred to above, however, had no means of knowing which was the less expensive course to pursue. They did not know what their goods cost them and in quite a number of cases they could not even make an estimate. There have been operators whose only method of figuring cost was to take the mining rate, add 50 per cent to it and call the result cost. This method, of course, was ridiculous then, and is still more so now, but, fortunately, I do not believe that any operator today is so short-sighted as to follow such a method.

Departmental Uses of Cost Data

In the management of a coal-producing business there are three departments which need and should use the information supplied by a proper accounting system, and the needs and uses of the two departments of lesser importance must give way to the needs and uses of the one of prime importance. To my mind the department of prime importance is the operating department. An operating department which does not have the proper information is absolutely at sea. The head of the operating department may know that his product is costing too much money but he cannot put his finger on the leak. The only way that he can gather any information is through conversation with his foremen, or possibly the mine superintendent.

These men are nearly all practical men, and as a result of their training and experience are prone to discredit figures and to rely on personal observation when they have to make decisions. Moreover, superintendents and foremen are not alone in taking this view. Many operators in this country are practical men who have come up from the ranks and who know the operating game from start to finish. It is always hard to convince such men that figures are more reliable than their own judgments. There have been many instances when practical men have positively refused to believe figures which were presented to them, although the figures were susceptible of proof. But, as stated before, conditions have changed and the operating men of today are depending more and more on statistics to guide them, with beneficial results not only to themselves but to the whole industry.

Sales Department Must Be Apprised of Costs

The second department that needs the information which is supplied by a proper accounting and cost system is the sales department. No matter how efficient the operating department may be, all its good work will be for naught if the sales department does not know the price that it must obtain for coal in order to avoid a loss. It is true that coal is a commodity the price of which is governed by the law of supply and demand to a greater extent than almost any other commodity.

When industry needs coal it will have coal regardless of price, and when it does not need coal it will not purchase, no matter how low the price or how advantageous the terms. When the supply is largely in excess of demand, prices are bound to drop. There is, however, a wall which should prevent prices from going too low, and that wall is the knowledge of the cost of production. In fixing sales prices the sales department may sometimes, as mentioned above, make a low price even though they may lose a little money, on the ground that it is cheaper to sell at a small loss than to shut down. But such prices ought to be made with a full knowledge of what the actual loss is. To make them on any other basis is pure guess work and may lead to serious consequences.

The third department which needs the assistance of a proper accounting system is the financial department. However, this department does not need the information as promptly as the other two, and the old method of ascertaining the financial status of the business at intervals, sometimes of a year, answered the purpose satisfactorily.

*From an article based upon a paper read before the Pittsburgh Chapter of the National Association of Cost Accountants. Copyrighted by National Association of Cost Accountants.

†Commissioner, Pittsburgh Coal Producers' Association, Pittsburgh, Pa.

Entirely too much stress has been laid on the importance of the purely financial uses of accounting systems. It is a very nice thing for the treasurer to prepare statements for the directors and stockholders showing the entire operation of the company, and how much money they have made, but this does not help to make more. The operating department, by reducing costs when it knows what the items are, can save. The sales department, by refusing to make prices which are too low, can save. It is these two departments combined that can enable the financial department to make statements which will meet with the approval of the directors and stockholders.

Payroll Expenditures First to Be Analyzed

To get down to details, the first analysis of expenditures that must be made is the payroll. Here the accountant is confronted with a stumbling block, in the form of traditional practice. Years ago, probably because inside men and outside men drew different rates of pay, the only subdivision of labor was between inside labor and outside labor. In the light of modern accounting methods this practice appears rather ridiculous. A coal-mining operation is very much like any manufacturing business, with the exception that the operator must buy all of his raw material at one time, whereas the ordinary manufacturer can buy his raw material as he needs it, and can renew his stocks from time to time.

The principles of accounting for mining are exactly the same as in any other business, and the distribution of labor in mining should be arranged along exactly the same lines as the distribution of labor in a manufacturing plant. Operators must abandon the idea that the place where a man works has any bearing on the account to which his salary should be charged. The purpose for which the man is employed and the effect of his work on the general operation of the business should be the determining factors in the distribution of his pay.

Mine Workers Comprise Main Labor Division

The first main division of labor in a mining plant, as in any other plant, is direct or productive labor. In mining operations the direct laborer is the man at the face, who is paid on a tonnage basis. He is the real producer in the mine and all other labor is incidental to his work. Consequently the first division of labor is mining. The second main division of labor, which is called indirect labor, is that which is necessary to enable the direct laborer to do his work. The operator can have as many subdivisions of his indirect labor as he sees fit. For example, he may subdivide it into timbering, track laying, drainage, ventilation, haulage, hoisting, dumping, tallying, preparation, and into as many other subdivisions as he wants.

The third main division of labor is that engaged in maintenance and repair work. This division is composed of the men who maintain the mine in working condition. Under this heading should be included development work, and to a great extent yardage and dead work. In some mines, of course, a large proportion of yardage and dead work is incidental to mining—that is, if there is a thin vein and the miner is required to take down a certain amount of roof, that labor constitutes part of the mining cost. But where yardage or dead work is done in connection with development work, it should not be included in the mining cost, but should be a part of the third division of labor, maintenance and repairs.‡

In considering the use of figures from a distribution of labor§ such as outlined, it readily will be seen that the superintendent or head of the operating department has no control over the cost per ton of the first division of labor, mining cost, because the miners are paid at a certain specified rate per ton which remains the same irrespective of the quantity mined. However, he has a very decided control over the second and third divisions.

The second division, or indirect labor, is the item where in most business concerns the greatest leaks occur. In this respect the coal-mining industry is not an exception. The total of this division does not bear a direct relation to the amount of production. It varies to some extent with production, because the more direct labor you have, the more indirect labor must necessarily be done. But in some operations an increase of 25 per cent can be made in the production without any appreciable difference in the cost of indirect labor. The indirect laborer must be ready to do his work when the coal comes up, and if sufficient coal is not coming up he waits until the coal is ready to move. This condition applies to practically all of the men grouped under indirect labor.

Do Higher Wages Lessen Efficiency?

If the contention of many well-known statisticians that increases in wages frequently result in lessened efficiency on the part of the men—because they either do not work as hard or they do not work as steadily—is true, then the direct labor, which is paid on a tonnage basis, will not reflect this feature, but the indirect labor unquestionably will. Irregular work on the part of direct labor is shown by an increase in the tonnage cost of indirect labor, because indirect labor, which is paid by the day, must be on the job at all times ready to do its work.

Irregular work on the part of the direct labor means the production of a smaller number of tons per day. If production is reduced and the indirect labor cost remains the same per day, the cost per ton will necessarily increase. Inefficiency on the part of indirect labor will also cause an increase in the cost of this item per day, because it takes more inefficient men to do the same amount of work. The superintendent when he gets his payroll analysis on this basis is at once put on notice when his costs are getting too high.

There are several other forms of labor which appear on the payroll and which are more or less fixed; in fact, they practically do not fluctuate at all with production. These items are the salaries of the mine superintendent, the mine office and the power department. These items are really indirect labor, but they should be kept separate because they cannot be controlled. It is advisable to know what it costs to produce power, and for this reason the labor cost of power employees should be grouped separately.

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‡The following statement in regard to dead work appears in the uniform cost system of the National Coal Association: "As every mine presents physical conditions peculiar to itself, no two mines being alike, and as the physical conditions fluctuate as the work progresses, in order to work out comparable statements and records, dead work should be classified in accordance with its nature, such as yardage, premium for narrow work, shooting rock, lifting bottom, taking down top, stowing and dumping gob, cleaning up falls and retimbering after them, handling squeezes, mine fires, or any other work imposed by adverse physical conditions."

§The system of the National Coal Association is supplemented by a suggested form for distribution of mine labor in conformity with the principles advanced in the system.

Efficient Sales-Record System Enables Small Force to Keep Track of Large Clientele and Heavy Tonnage

Good Workable Scheme of Sales Records Is Factor in Effective Marketing, Eliminating the Mistakes That Anger Customers—Specimen Cards That Feature a Plan Now in Successful Operation

NOT the least important of the work of a coal company is the method of keeping records in the sales office, though the routine is often something that, being uninteresting to many officials, has not reached a very high state of development. The system described here is that developed by H. W. Henry, vice-president of Peale, Peacock & Kerr, and is used to handle the distribution of between 3,500,000 and 4,000,000 tons of coal per year to 750 accounts from about thirty mines in central Pennsylvania. This description covers only the records of the sales office in New York and, it is believed, will be of interest because of its simplicity. A good system of sales records, simple in operation, is a factor in good marketing, for a few mistakes through faulty records will go far toward rousing the wrath of a customer.

The first record, of course, is the contract, or if spot sale, the order. The acknowledgment is made on a standard form, on half letter size, with the name of shipper, date line and, if a shipment on contract, the words "subject to the terms and conditions of our contract with you, we acknowledge receipt of your" order to ship so many cars of coal. A serial file number, assigned to every customer, no matter how small, is placed on the acknowledgment of the order and on every record and item of correspondence pertaining to that customer.

The same clerk acknowledging the order makes out in duplicate an order slip giving full particulars for the guidance of the shipping and billing clerks at the headquarters distribution office at St. Benedict, Pa., in the mining region, to which the original is mailed, the carbon being kept in the New York office. The order slip, which is on a "4 x 6" form is reproduced here:

Order No.....Date.....19....
Consignee .....
Destination .....
Route No.....Freight Prepaid—Collect
Make no shipments on this order after.....
{Combined weight of car and lading} {must not exceed.....pounds}
Quantity .....
Quality .....Consignees unload through bottoms—over side of car
Price $.....per gross ton F.O.B. car at mines.....
Copies of this order mailed to
Invoice to .....
.....
File No. .....

PEALE, PEACOCK & KERR

Immediately the car or cars on each order are shipped from the mine a postal card notice is sent the consignee

Consignees Unload {On trestle / Over side of car} Consignee
Quality Notify
Contract / For Effective / Expires
File No. Freight {Prepaid / Collect}

Destination Route
Invoice to Account
Price

Year	Month	Ship	1	2	3	4	5	6	7	8	9	10	11	12	26	27	28	29	30	31	Ordered	Shipped	Over	Short	Remarks
	April																								
	May																								
	June																								
	July																								
	August																								
	September																								
	October																								
	November																								
	December																								
	January																								
	February																								
	March																								
Our Order No.																									
Buyers' Reference																									

DAILY RECORD OF SHIPMENTS THAT CONSTITUTES A MONTHLY AND YEARLY RECORD

This form, used in the New York office of Peale, Peacock & Kerr, provides a complete record of shipments day by day against orders and contracts, by which the distribution office can draw on a moment's notice a summary of transactions to date. The data are posted on this sheet from orders and contracts as received and from daily mine reports of cars billed.

on which under the date is the line "shipped for your account following cars of bituminous coal," together with notation of date of shipment, car numbers and initials and consignee and destination, with a final note stating that the coal will be invoiced under date on which it passes the railroad scales.

At the end of each day the distribution office makes out a report for each mine showing for that day the following information on each car loaded and billed: Waybill, car initial and number, railroad scale weight (when available that day) and consignee and destination. The reports are mailed to the New York office and are the basis for the shipment-ledger records at headquarters.

In this record Mr. Henry has provided a compact, comprehensive picture of the business for one year with each customer. The outline of the form on which the year's record of orders and shipments is kept is reproduced here in reduced form. The sheet as it is used measures 11 x 14.5 in. with 2.5 in. for binding in loose-leaf holders.

From the daily mine reports are posted the shipments in units of cars on the line and under the column corresponding respectively to the month and date of shipment. The space allowed for each day's record ($\frac{1}{4}$ x $\frac{1}{2}$ in.) is sufficient to permit showing by pencils of different color the shipments from several mines to the same consignee on the same day.

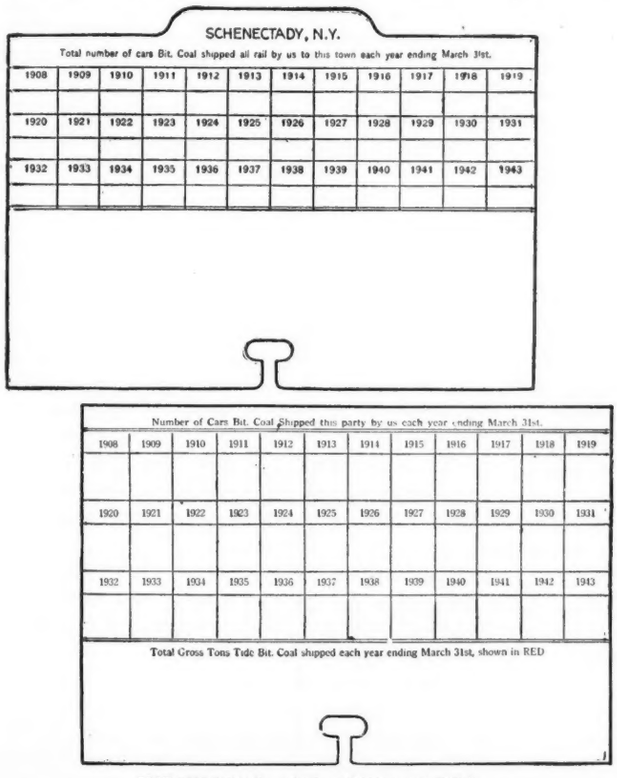
At the end of each month the total number of cars shipped is obtained by adding horizontally across the page. This total can be compared with the number of cars ordered and the number over or under is noted in the columns provided for this purpose. Month by month these figures of orders and shipments are carried forward down the sheet and at the end of the coal year the record is complete. These sheets are filed each year in permanent binders. Thus in this office there is a detailed record of all business ever done with any customer.

On a set of 4 x 6 filing cards, one for each consignee, is posted at the end of the year the total cars shipped. The card shows the same information for every year from the date of the first shipment to each customer. These cards are filed by states and towns and the "town card" provides a record for total shipments in cars to each town or community by years. Fac-similes of the individual and town cards are reproduced in the preceding column.

The card for the individual contains the following data on one side:

Name and address of customer.....
Location of Plant .....
Annual Requirements .....
Storage Capacity .....
Delivery via. .....
Consignees unload on trestle—over side of car.....
Restrictions as to kind or size of cars.....
Remarks .....

These cards and their summaries of business constitute a valuable record and one that permits a small office force to keep in touch with many customers and a large tonnage.



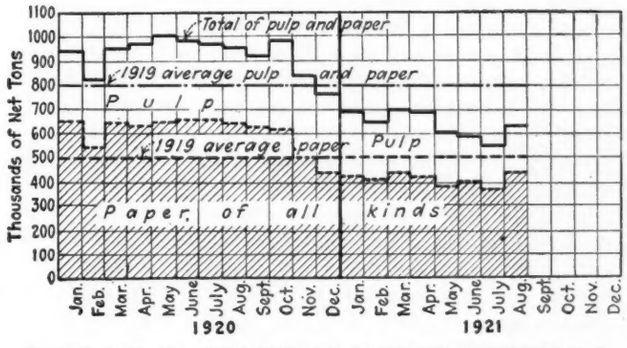
INDIVIDUAL AND TOWN CARDS

Fac-similes of cards on which yearly records are kept of the number of cars of coal shipped to individual customers and to all customers in each town.

Paper Industry a Large Consumer of Coal

FOR every ton of paper manufactured from pulp there is consumed one ton of bituminous coal and likewise for each ton of pulp produced one ton of steam coal is burned. Thus combined pulp and paper production gives a measure of coal consumed in the production of paper.

The accompanying diagram shows the monthly production of pulp and paper in the United States, as reported by the Federal Trade Commission, for 1920 and 1921 to August, compared with the monthly averages of 1919. In May and again in October, 1920, the consumption of coal in this industry approximated 1,000,000 tons. The average for 1919 was 800,000 tons per month, or about 185,000 tons per week, and in 1920, 931,000 tons per month, or 215,000 tons per week. A part of the drop in coal production this year is accounted for by the drop in the total requirements of the paper industry, for July, 1921, was but little more than one-half the peak in 1920. The latest data, that for August, indicates an upward turn.



PAPER AND PULP PRODUCED IN THE UNITED STATES

Each ton of pulp and paper represents the consumption of one ton of steam coal.

WHAT THE COUNTRY NEEDS from the miners and operators is more underground operation and fewer field operations.—*Little Rock Arkansas Gazette.*

Selling Coal to Industrial Consumers Requires Educated Salesmen of Highest Type

Entirely Different Methods Pursued with Retail Dealers—Letters with Personal Touch Prove Useful Adjuncts—Many Operators Maintain Their Own Selling Organizations in Preference to Marketing Through Jobbers

By Haven A. Requa*

A GREAT many operators who formerly sold their output through jobbers have come to the conclusion that their best interest is served by maintaining their own sales organizations. Roughly speaking, an operator producing twenty cars per day can afford to hire a man to look after the sales. Larger tonnages, of course, require larger sales forces. Operators who have tried both ways decided that they obtain much better results when selling their own coal. On a weak market the tendency to cut prices is not so great, for very often a wholesaler shades his price more than is necessary. Recent history shows that more and more operators are selling their own product, in the belief that they can serve their own interests better than anyone else. Then, of course, there is an unmistakable tendency of the public to eliminate the middleman and deal direct with the producer.

Tactics Vary With Different Lines of Trade

Selling domestic coal and selling steam coal require entirely different tactics. The salesman on the road who has worked up a nice trade with the retail dealers is seldom a great success as a salesman of steam coal, and, on the other hand, the man who is extraordinarily successful with the steam trade is often a complete failure when it comes to soliciting orders for the domestic sizes. The reason for this is found in the difference between the mentality of the average purchasing agent for a factory and the average retail coal dealer.

The industrial purchasing agent is a very busy man whose purpose is to make a saving for his company, and in order to sell him it is necessary to show him quickly where your particular coal will produce more heat for a cent than the coal of your competitor. The retail dealer, however, is generally an easy-going and friendly individual with plenty of time to talk with a visiting salesman and who has to be worked up just right before he will place an order. Should he be approached quickly, he would, nine times out of ten, refuse to book an order. The purchasing agent would throw any salesman out of his office who displayed a tendency to sit down and talk politics half an hour or so before getting down to business.

Some coals are particularly adapted for domestic use, while others can be marketed only for industrial purposes. More salesmen are required to move a given tonnage of domestic coal than of steam coal. As a rule, though, a good domestic coal is more profitable to produce and sell than is industrial fuel. Selling domestic coal under such circumstances as existed during the past summer is a complicated and trying process. A good conscientious salesman, if he is equipped with an automobile, can average about six medium-sized towns per day. After calling on all of his prospects and his customers, he sends a report every night to his home office. If these reports, covering his daily activities, are made out in a thorough manner, they are invaluable to the sales manager and his office.

Well organized distributors of domestic coal have elaborate and efficient "follow-up" systems. After a salesman calls on a dealer for the first time and the record of the call has been forwarded to the home office, the dealer receives a typewritten letter mentioning the salesman's call and, incidentally, one or two pertinent facts relative to the coal sold by the firm. These letters appear to be typewritten, but as a matter of fact they are printed in quantities with spaces left for the address, in such a way as to have every appearance of being personal letters. Great care must be taken to make these letters appear individual, for if a retailer knows he is receiving a routine circular, the value of the appeal is lost.

After the first letter has been sent, the dealer's name is filed so that it will came up automatically for another letter after two weeks. The second follow-up letter then goes out. This letter should be less than a page and should discuss the quality of the coal. A week later, if no reply has been received from the dealer, a third letter should be sent. This letter can be on preparation, and ought to carry considerable detailed information. After another two weeks the fourth "personal" letter will go out, this time dwelling on the "service" angle. If it is deemed wise, other letters can follow, all containing facts about the coal which will prove of interest to the dealer.

Salesman's Task Made Easy by Letters

In the meantime the salesman has, in all probability, made a second personal call, and he generally will find that the way is made easy for an order if one has not already been mailed in to the home office direct by the dealer. The retail dealer generally is interested in letters of this type because they give him information for which he pays nothing and which prove valuable to him in his contact with buyers. Where an accurate record of this kind of "follow-up" work has been made, it has been found that the effort more than justified the expense, as one competent stenographer can easily handle the routine work.

Circular letters, of course, are a help although, unless they quote attractive prices, but few orders result and their primary value will be as advertising. Circular letters, if consistently used, give salesmen a certain standing with the trade, often serving as an introduction to the trade. Letters can be used in another way. A letter to a dealer who has bought his first carload of your coal on the date he is due to receive his coal from the railroad, inquiring if the coal is satisfactory and soliciting another order, nearly always brings good results. It pleases the dealer to know you are in-

*Sales manager, Columbus Mining Co., Chicago, Ill.

terested in him and want to keep his business. Letters of this nature can also be printed in bulk and used when needed. It has been found in this, too, that a second or even a third letter is worth while sending. It naturally pleases a dealer to know that his business is sought. Letters are playing a more important part in the sale of coal than ever before.

Selling coal for industrial purposes is almost a profession in itself. In the good old days the chief requirements of a good salesman of steam coal were primarily a likable disposition, a well-developed gift of gab, a limited knowledge of coal and some information on competitors. Some years ago, according to a current story, an enterprising young capitalist had invested a fortune in new developments in Illinois. To speed up sales and to stimulate his salesmen, this young man decided to call on the steam trade himself. His first call was on an up-to-date and keen buyer for one of the packers. The aggressive young mine owner was asked many questions which were more or less satisfactorily answered. Finally the purchasing agent asked how many B.t.u.'s there were in the coal. The young man got indignant, pounded the table, and answered, "I'll have you understand there are no impurities whatsoever in my coal." Those were the good old days, when coal was bought very largely on the basis of whether or not it pleased the boys in the fire room.

Combustion Experts Sell to Large Consumers

Now all is changed. The men who are selling coal to the big buyers are the specialists who have a knowledge of chemistry, combustion and engineering, and, talking the language of the purchasing agents, can demonstrate that their coal delivers more heat units for a cent than that of their rivals. These specialists are only good in getting business from the big buyers, and in large quantities. Send a man like this to a small creamery or factory and he probably would be useless, as this type of buyer would look upon him as a highbrow, or, worse still, as a theorist. As a general rule the big buyer is looking for advice, and is glad to listen to anybody if he thinks he is going to learn something in regard to reducing his costs. Not so with this other type, who resents suggestions and believes he is an authority on all coal. This type of small buyer of steam coal will respond to the same tactics as the retailer. The steam coal experts, or, as they are now designated, "combustion engineers," have come to stay, and more and more the larger companies employ them regularly. Some companies producing byproduct coal go even further and have salaried gas engineers who travel about the country giving advice and the benefit of their experience—both valuable—to the customers of the firm.

During the spring and summer months of this year there developed an epidemic of refusing cars of coal. Both the retailers and steam users did it at every possible turn. If a car of coal was the slightest bit off, either on account of faulty preparation or poor quality, the producer promptly heard about it in no uncertain terms. This "refusal" evil, after getting a good start early in the spring, grew to such alarming proportions that by midsummer it had engaged the attention of a number of operators' associations and others interested in marketing coal. Nothing of much benefit to the trade was accomplished. The only successful way to combat an abuse like this lies in avoiding it by carefully picking your customers. If a man has the reputation for being arbitrary and for making unjust deductions, it is far better not to sell him coal.

When a car of coal is refused by a reliable concern it generally means that the coal is at fault in some way, and the best way to settle the matter is to make an adjustment. If a salesman is delegated to go and inspect the car, very frequently he will take the side of his customer and demand from the house a larger reduction in price than necessary. This is only natural, as a salesman is generally anxious to retain the good will of his customer. The sales manager, on the other hand, generally leans to the other extreme and wants to make a reduction so small that it does not actually cover the loss and inconvenience the customer has been put to. Be sure your customer is on the square, then be liberal with him. Satisfied customers are an asset no company can afford to overlook.

Industrial Depression Provides Training

This year has certainly been a hard one, especially for those connected in any way with the coal industry; but in spite of this, perhaps our present misfortunes are going to prove to be of lasting benefit to us. For one thing, they have put us all in fine shape to tackle our sales problems once business gets back to normal. All the fat gained through the easy selling of coal during war years has been worked off and once more we are trained down and in fine condition to tackle with confidence and enthusiasm even the hardest sales problem. Competition is healthy when it isn't carried to extremes, and competition makes us go out of our way to be of real service to the public. Serving the public is about the most important thing we have to do, and we are better fitted for this work now than we ever were before. This "Serving the Public" idea may sound vague and impractical and perhaps a bit philanthropic but put yourself in the other man's shoes and see how it works out. Are you going to buy coal from the firm that just sells you coal, or are you going to buy from the firm which takes an intelligent interest in you and your problems, and always tries to accommodate? And what's that but service?

Retail Prices of Food Recede in Nine Large Cities, Gain in Richmond

CHANGES in the retail cost of food in September, in 10 principal cities of the United States, are shown in compilations by the U. S. Department of Labor, through the Bureau of Labor Statistics.

During the month from Aug. 15 to Sept. 15, 1921, there was a decrease in all but one of these cities. In Richmond there was an increase of 2 per cent. In Baltimore and Chicago there was a decrease of 3 per cent; in Manchester, 2 per cent; in Bridgeport, Butte, New York and Providence, 1 per cent. In Peoria and Washington, D. C., there was a decrease of four-tenths of 1 per cent.

For the year period Sept. 15, 1920, to Sept. 15, 1921, there was a decrease of 27 per cent in Butte, 26 per cent in Baltimore, 25 per cent in Chicago, Manchester and Peoria; 23 per cent in Bridgeport, New York and Providence; 22 per cent in Richmond, and 21 per cent in Washington, D. C.

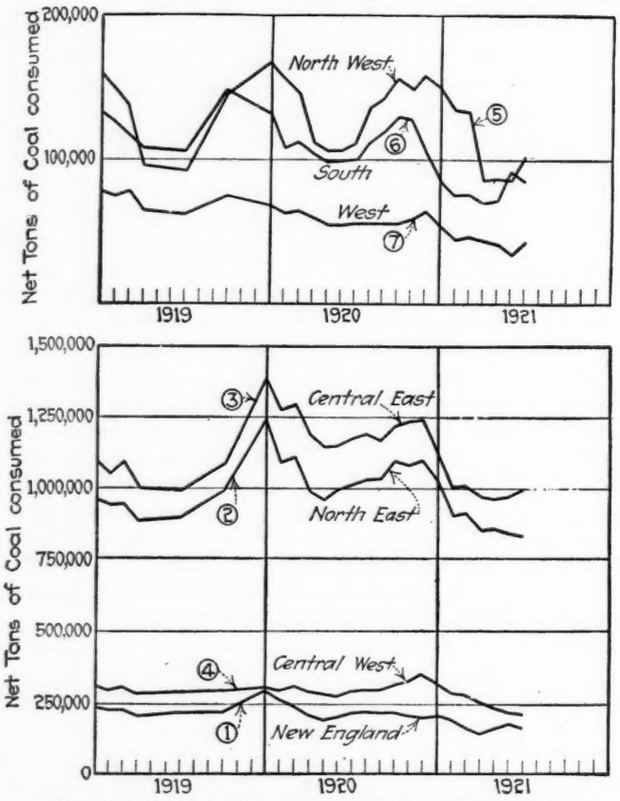
As compared with the average cost in the year 1913 the retail cost of food on Sept. 15, 1921, showed an increase of 67 per cent in Richmond; 65 per cent in Washington, D. C.; 63 per cent in Providence; 58 per cent in Manchester; 57 per cent in New York; 55 per cent in Chicago, and 54 per cent in Baltimore. Prices were not obtained from Bridgeport, Butte or Peoria in 1913, hence no comparison for the 8-year period can be given for these cities.

Coal Custom of Public Utilities Sought When Spot Market Is Low

PUBLIC utilities are the most regular customers of the coal shipper of any of the important users. This is true because, considering the business as a whole, the largest part of their power output is used for lighting and traction, uses that are more constant than the power load of industrial plants. When business is dull, manufacturing ceases, but the houses and streets must be lighted and street cars must operate.

It has been the unfortunate experience of the utilities to be undesirable and unpopular when the spot market is high, as in 1917 and again in 1920, but in 1919 the coal distributor courted the business of the utility and again this year he seeks it.

Limitations on revenue imposed by regulations prevent the utilities from paying the highest prices and their troubles are great during periods of car shortage



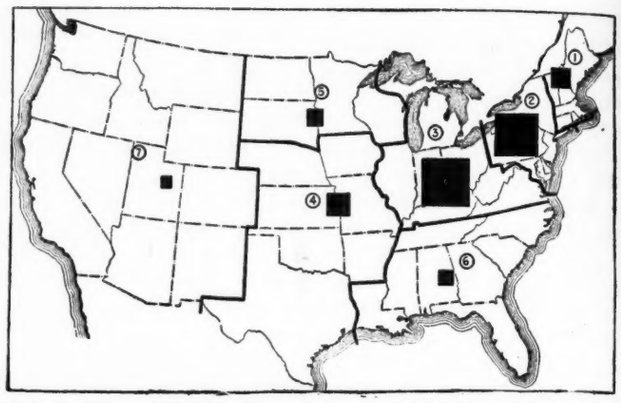
CONSUMPTION OF COAL BY PUBLIC UTILITIES BY MONTHS, BY GROUPS OF STATES

The numbers correspond to the groups shown on the accompanying map. Note that the vertical scale of the lower diagram is five times that of the upper and that the quantities in these subdivisions are much smaller than in the groups shown in the upper diagram.

and curtailed deliveries on contracts. Like railroad business, however, this class of trade is sought by large producers because of its dependability, even though it is not always the source of greatest profit. The accompanying map, showing the distribution of consumption of coal by utilities and the relative importance of this class of user in the East, is based on data published by the Geological Survey.

Another diagram compares the total production of bituminous coal, month by month, with coal consumed by electric utilities. This diagram clearly shows the comparative stability of utility coal consumption and the proportion it represents to all soft coal produced.

The curves for the large industrial areas of the

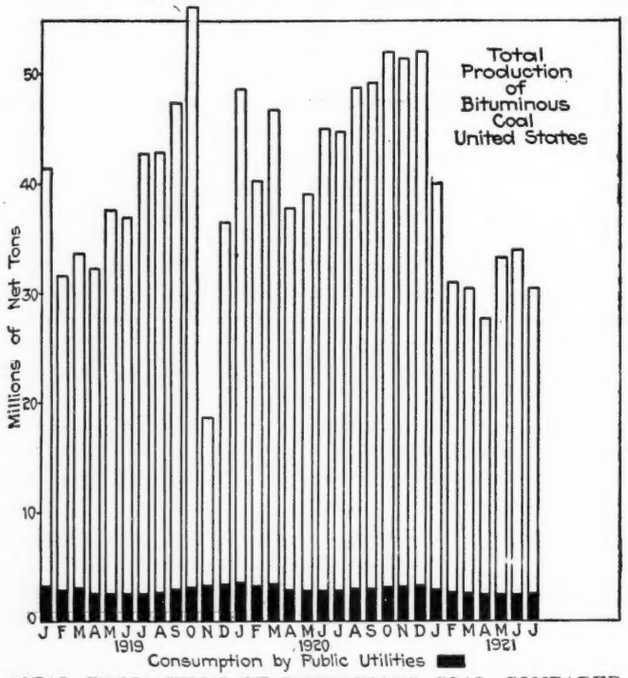


RELATIVE CONSUMPTION OF COAL BY PUBLIC UTILITIES IN DIFFERENT PARTS OF THE COUNTRY

Each of the solid black squares is proportional to the quantity of coal burned by central power plants in the corresponding subdivision of the United States, based on the figures for 1920.

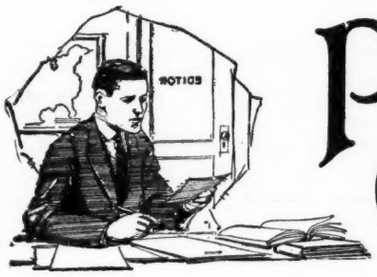
Central and Northeastern United States bring out two things about the power demand and hence the consumption of coal by this class of users. These curves show a general bulge upward representing the boom in business in 1920 preceded by the post-armistice slump of 1919 and followed by the world wide depression of 1921. The curve is modified, however, by the seasonal factor, that part of the curves covering the winter of 1919-20 picturing this more clearly than that covering the winter of 1920-21. The decline in business began to be felt in December, 1920, and the decrease in demand for power for industrials more than overcame the usual winter peak in the lighting and traction load.

The curves for the Central West and New England disclose somewhat the same tendencies. Despite varying competition of fuel oil and water power, the West shows a curve more nearly straight than any other section. The Northwest and the South present the best examples of purely seasonal fluctuation.


Millions of Net Tons
50
40
30
20
10
0
Total Production of Bituminous Coal United States
J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J
1919
1920
1921
Consumption by Public Utilities

TOTAL PRODUCTION OF BITUMINOUS COAL COMPARED WITH CONSUMPTION OF COAL BY PUBLIC UTILITIES, BY MONTHS, 1919-1921

Although representing but an average of from 6 to 8 per cent of the total consumption of soft coal, the rate of use from month to month is remarkably constant, as compared with the fluctuations in both total consumption and production, as shown in this diagram.



Problems of Operating Men

Edited by James T. Beard

Concentration Essential to Better Mining

Economic Extraction of Coal Depends Primarily Upon Method Employed—Effective Disposition of Producing Factors Likewise Important

THE principle of economy of time and labor is universally recognized as being essential to the successful operation of any business or industry. The principle involves the choice of a scientific method of working, in order to be most effective in production. Conservatism in management will avail little if this principle is ignored.

In the mining of coal, the most essential and characteristic feature of a scientific method of working, is the concentration of the largest number of producing factors. I am referring now to the men and the machinery employed in mining, transporting and loading the coal. These must be disposed in a manner to make their work most effective.

Where concentration is carried out intelligently there results increased production at a less cost of operation, even though the method of working is not the best adapted to the physical conditions in the particular field. On the other hand, the adoption of a good method of working will bring poor results when the producing factors are widely scattered about the mine.

Planning and Developing a Mine for Efficient Production

In considering the most effective production of coal, my first thought is to plan and develop the mine in a manner that will permit of working the largest number of men and machines in a minimum space, consistent with the full productive efficiency of each of these elements, and having due re gard to the physical conditions surrounding the work. Expressed in a few words, this means the operation of a continuous working face as far as that is practicable.

The system of coal extraction most commonly practised in the United States is that known as the room-and-pillar system. The development is generally on the advancing plan. This system of mining does not present conditions that are ideal for the most effective concentration of the work, however.

While it is not my purpose to discuss the relative merits and demerits of the different systems of mining, I want to say that the longwall advancing method so largely employed in England and on the Continent, lends itself naturally to the most effective concentration of work, and is particularly advantageous in reducing the cost of operation to a minimum.

Where a mine is being worked on the room-and-pillar system, the principle of concentration can be applied to a limited extent, however, and will have an economic value. This is best accomplished when the coal is worked on the retreating plan, in which the headings are driven to the boundary, or any desired limit, before any rooms are turned.

Advancing System Not Efficient

At present, the almost universal practice is to open and drive rooms as rapidly as the developing entries advance. Under those conditions, unless the entries are double-shifted, the development in the rooms will be too rapid for the development of the entries, and the result will be a limited producing area. In such a case, it will be necessary to distribute the several factors, machines and men, over a more or less widely separated area.

This condition is particularly observable in the working of low seams of coal. It becomes then a matter of economy to extract the pillars in the rooms as quickly as the latter are finished; and the entry practically ceases to be a producer of any consequence when it has once reached its boundary or limit.

The rooms being worked out on the advancing plan, there only remain the room stumps, the chain pillar and the barrier pillar to be extracted when the boundary is reached. It will generally be necessary to take these out with a pick. In that work but a limited number of men can be employed, under the most favorable conditions.

Concentration in Retreating Plan

In the retreating system, on the other hand, the process is reversed. No rooms are developed until the entries reach the boundary or limit. Then, any desired number of rooms can be turned at once, which affords a greater concentration of men and machinery. The possibility of a squeeze is practically eliminated, ventilation is better and more easily maintained and the expense of operation generally reduced, while greater safety is secured.

My experience is that the longwall-retreating method of mining, or some modification of that method in the form of a panel system in which the coal is worked out on the retreating plan, affords the best means for the concentration of the work, a maximum degree of safety and reduces the cost of operation to a minimum. This, of course, assumes that the natural conditions are favorable to the plan adopted.

The practical economic features of a retreating method of coal extraction is generally conceded by authorities on coal mining. While most operators believe this to be true, they still continue the more wasteful and expensive methods, because of the demand for quick returns on the investment. Let me close by saying that more economic coal extraction can be established only by adopting a method that will permit of the greatest saving of time and labor.

Maple Ridge, Pa. I. C. Parfitt.

Situation Today in Mining Coal

Primitive methods of mining coal with pick and shovel—Coal, the chief source of energy—Improved methods demanded by present serious industrial depression—Larger pillars advocated in mining.

IN THE early history of coal mining little thought was given to the necessity for improved methods. The coal was taken out with a pick and loaded into the cars with a shovel. Today, these primitive methods have given place to different types of cutting machines and much of our coal is loaded by mechanical loaders.

No one ever thinks now of mining coal by what was then known as the "bell-pit" system. For many reasons, but chiefly because of the greater depth to which we must go to reach the coal, such a system has long since been abandoned as impracticable.

Improved Methods Required

In order to provide for the greater cost of shaft sinking and the expensive mechanical equipment now employed, to say nothing of the higher cost of labor, if we are to realize on the investment in a coal proposition today, it is necessary to adopt improved methods, both in the mine and on the surface. This demand is greater now than ever.

When we consider that coal is the chief source of energy and, indeed, the main factor in the industrial life of a nation the necessity is more than ever apparent of finding means and methods by which to conserve this energy and use it to the best advantage.

This means that our coal must be put into the hands of the consumer, or delivered at the place of consumption, in the best possible condition and of good quality. Such are the conditions prevailing in the industry today, however, that producers have been prone to disregard these essential factors and there has resulted a large waste in the production of coal.

At present we are facing a serious industrial depression. Every one, from the miner to the operator, dealer and consumer, is affected. The situation demands not only retrenchment but the giving of careful thought to the means and methods employed in the production and use of coal.

Advantages Derived from Leaving Larger Pillars

Speaking in reference to mining, attention has been drawn many times, in *Coal Age*, to the fact that greater efficiency is made possible by planning the work underground so as to provide larger pillars, whereby a greater length of working face is presented and there is less risk of the roof pressure crushing the coal and rendering the work of mining unsafe.

In the adoption of such a plan, a larger territory can be reached from a single shaft and the life of the mine is extended. The cost of production is decreased by reason of more efficient facilities for ventilation, drainage, haulage and timbering. There is also a greater concentration of the work in the mine, which is a large factor in successful operation.

It is not necessary to more than refer, here, to these items in successful mining, as they have been fully explained and discussed by different writers in *Coal Age*. It is enough to say that the present situation calls for their careful consideration and adoption wherever conditions will permit. In a previous letter, *Coal Age*, Aug. 25, p. 301, I have explained these conditions more fully.

Linton, Ind. W. H. Luxton.

More Lump, Less Screenings

Producing large coal a big problem—Actual experience of greater value than assumed opinions—Charging and tamping holes in blasting.

DEMAND for lump and the larger sizes of coal is now and always has been one of the coal operators' big problems. It is taken for granted that any suggestion tending to decrease the amount of screenings, in the output of mines, will be gladly welcomed by the producer.

In arguing this question, it may be assumed that every effort has been made to work all rooms on the face of the coal, wherever this was practicable; also, that the coal is properly mined by being undercut, topcut, center cut or sheared. The production of large coal, in any particular mine, then depends on the practice prevailing in that mine in respect to the blasting, loading and transportation of the coal.

Opinions, however practical, are never of the same value as the actual experience of men in the work of mining coal. For this reason, I propose now to recite, more or less briefly, the experience of one of the largest producers of domestic coal in this country.

Close Inspection Unavailing To Reduce Amount of Screenings

Without mentioning the name of the mine or its location, let me say that the closest inspection of the working faces had always been maintained in that mine, for the purpose of seeing that every shot was properly mined and the place made safe before the blast was fired. In addition to this, special efforts were made to secure the honest co-operation of the miners in loading clean coal.

Notwithstanding, however, there was still an oversupply of the smaller sizes of coal, and the tonnage of lump fell short of the demand. In view of these conditions it was then decided to secure the advice of manufacturers of explosives, all of whom claimed to be able to increase the lump tonnage in a mine.

As a result of the correspondence that followed different manufacturers sent their experts to the mine to investigate the conditions and advise regarding the weight and kind of explosive to be used and the manner of shooting the coal. These explosive experts, of course, came at different times and worked separately, each demonstrating the kind of explosives manufactured by his firm.

Demonstrating Proper Use of Powder Brings Results

Previous to the coming of the experts, it had been the practice of our miners to use road dirt and coal slack for the stemming when tamping their holes. All three of the experts who came to the mine, however, would use nothing but clay for stemming and this had to be about the consistency of putty. They all tamped the charge to the mouth of the hole with clay, and the result was they could always tell just what a shot would do before it was fired.

We employed only thoroughly competent miners and, at times, it was amusing to watch these old-timers when an expert tried to show them how they should shoot their coal. But it did not take long to make us one and all understand that we had much to learn.

While each expert used a different explosive, the results were in every instance the same. Each used the same care in preparing the shot, and a big pile of lump coal would be shaken loose and not scattered along the road, 20 or 30 ft. back from the face.

We observed, as was explained by the experts, that the clay when well tamped held the explosive charge right where it was wanted. The result was that the coal was not shattered or broken into fine fragments and dust. Neither was a shot left standing to be dug out with a pick, which every miner knows is the hardest work done in a coal mine and produces much fine coal.

The same practice was tried, a little later, at a new mine where the coal was being shot off the solid. Here also it was found that the best results were obtained in using the clay stemming to tamp the hole, which became the general practice in both mines.

The results in blasting proved so good that the company lost no time in having clay delivered to every third room, where it would be handy for the use of the men. On their part, the miners were so well pleased with the results of this change that they would not shoot a hole without first tamping it with clay. Everyone observed that, not only was the amount of lump coal greatly increased, but there were no blownout shots and the labor of mining the coal was far less than previously. George Edwards.

Pikeville, Ky.

Thoughts on Locomotive Haulage

Practical suggestions in regard to providing surplus of power on a 2-mile haul in a mine having an output of 2,500 tons per day and using electric coal cutters.

IT WAS with keen interest that I read the reply given to a correspondent who asked for the correct answer to an examination question on electric mine-locomotive haulage. My opinion is that while the question is a difficult one, it calls only for such knowledge as a mine inspector should possess.

My belief is that any man who aspires to the responsible position of state mine inspector should have acquired, in his mining experience, a knowledge of electric-power transmission and locomotive haulage that would enable him to answer this question in a practical way. Perhaps, he would rely more on his practical judgment and constructive ingenuity than on the technical formulas required to solve such a problem.

Helpful Suggestions

Although the readers of *Coal Age* have not been invited to discuss or criticise the answer given by the editor, it being a question of general interest I may be pardoned for offering a few practical comments and suggestions. Appreciating as I do the helpful spirit that prompted the editor to work out the solution to this problem, in detail, I hope that what I have to say will be understood as offered with a desire to be likewise helpful.

In the first place, I wish to say that the diagram of power transmission, on a 2-mile haul in a mine, as given in the reply to this inquiry, is concise, modern and first-class in every respect, showing the necessary transformers and converters required to effect the greatest saving.

It would seem that, while careful attention has been given to every detail regarding the necessary power for haulage and transmission into the mines, the reply appears to overlook

the power required to operate the mining machines for cutting the coal. Assuming that all of the 2,500 tons output of coal is cut by machines, I find that the power required to run these machines is even greater than that consumed in the haulage.

For example, assuming a daily average of 200 tons of coal cut by each machine, we will say an output of 2,500 tons a day will require 13 machines to cut the coal. Several makes of electric, chain machines are rated at 30 hp.

Although it would seldom, if ever, occur that all of these machines are operating at full capacity at one time, it will be well to estimate on the maximum condition. In that case, the power required to run the thirteen machines would be $13 \times 30 \times 0.746 = 300$ kw.

Now, the editorial reply has estimated that a maximum condition, in haulage, will require a 200-kw. generator in the powerhouse, which is correct. It is stated, however, that by using a No. 6 wire for Feeder B there will be a surplus of 18.861 kw. (25 hp.) available for the machines.

It is possible that this reply assumed that practically all of the coal will be cut at night, leaving the loaders free to break up and load their coal in the dayshift, which is the only reasonable explanation of why the power for the machines was not calculated.

POWER REQUIRED FOR MACHINES

Assuming that the coal is to be cut during the day, however, allow me to suggest that a 300-kw. generator should be installed as a separate unit in the powerhouse and operated exclusively for supplying power to the mining machines. This power should be transmitted to some central point in the mine, say a distance of 10,000 ft., and there transformed to a working pressure suitable for AC machines.

Again, assuming the same voltage (2,300 volts) and a wire return, the size of wire required for this transmission will be, for a 10 per cent line drop ($0.10 \times 2,300 = 230$ volts) and a current of $300,000 \div 2,300 = 130$ amp.,

$$A = \frac{21.6 \times 10,000 \times 130}{230} =$$

122,000 *circ.mils.*

which is a 00 wire B and S gage.

Before closing, allow me to refer to one or two other points relating to safety and efficiency in working and which seem worthy of consideration from a practical standpoint. These concern the use of a 500-volt circuit in this low seam (4½ ft. thick), and 30-lb. rails for this haulage.

In my opinion, a 250-volt circuit, as required by the state mining law in Alabama, would be safer. It is true it would require more copper for the DC current used in haulage in the mine. The current for the same power would be approximately doubled, requiring a 000, instead of a No. 1 wire on the inside three sections of the haul.

Disregarding the larger first cost, however, the heavier wire would give a greater rigidity, which would enable the trolley wheels to follow the wire better and cause less sparking.

Finally, although the old formulas in common use for finding the weight of rails on locomotive haulage require 10 lb. per yard, for each ton on the individual drivers, which calls for a weight of rail $10(10 \div 4) = 25$ lb. per yard, for 10-ton locomotives and the reply suggests the use of 30-lb. rails, even this I consider far too light for the proposition in hand.

This mine will operate, in a field of 3,000 acres; and assuming an 80 per cent recovery and 250 working days per year, say for 20 years, it will be a paying proposition to provide a good haulage road having a well balanced track of 60-lb. rails, which I have often seen laid on shorter hauls than this. The cost of upkeep is less and the danger of derailment of cars and consequent delay much less.

Bayview, Ala. JOHN WALLS, SR.

Inquiries Of General Interest

Building Brattice in Rise Headings To Remove Gas

Practical Points in Building Brattice To Remove Gas in Rise Headings — Set Posts Two Feet From Rib—Nail Boards on Intake Side of Posts

WE ARE anxious to learn the best and most practical way to build brattice in a pair of headings driven to the rise and which have been allowed to fill with firedamp formed by gas generated at the face of the headings.

In one section of our mine where the rooms are driven to the rise, we have been experiencing more and more difficulty in keeping the faces clear of gas. It has been necessary to use canvas nailed to posts set along the rib in each room, in order to conduct the air to the face.

Unless this is done there is not force enough in the air reaching the faces of the rooms to sweep away the gas. In an idle time, a while ago, some of these rooms filled with gas that gave us much trouble to remove.

At that time, there was considerable difference of opinion as to the right way to build a brattice in a room. Most of the old timers, however claimed that the air should be carried up on the small side and returned on the larger side of the brattice.

Any information that *Coal Age* or its practical readers can give us in regard to the building of brattices in rooms will be much appreciated and may assist others who are like situated.

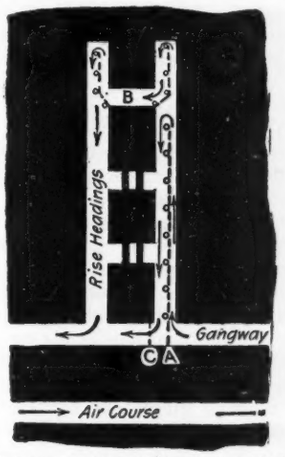
———, Pa. BRATTICEMAN.

The removal of gas from rise headings is always more difficult than where the headings run to the dip or are level. The gas being lighter than the air tends to rise and hang at the face of a pitch.

In order to overcome this natural tendency of the gas and sweep it from the face a strong current of air is required. In other words, the velocity of the current must be sufficient to disturb and carry off the gas.

As shown in the accompanying figure, a brattice is constructed, in a room or an entry, by first setting a line of posts parallel to the rib of the opening and about two feet from it. Canvas or boards are nailed to these posts on the rib or intake side.

By carrying the air up behind the line of brattice, the velocity of the current is much increased and is made more effective for removing the gas from its lodgment. The area of opening behind the brattice or the intake side, should be from one-fifth to one-fourth of that on the other side, which is the return.



REMOVING GAS FROM RISE HEADINGS

The figure illustrates the manner of removing a firedamp mixture from a rise heading that has been permitted to fill with gas down to the gangway. The arrows indicate the direction of the air current and the dotted lines show the position of the brattice.

Before taking any steps to disturb or remove this gas, notify and withdraw all the men working on the return of the air passing the headings.

Conditions may even make it advisable to withdraw the men from adjoining sections or from the entire mine.

Employ only reliable and experienced men equipped with approved safety lamps. Safeguard every approach to the return current. Now, proceed to increase the air volume and following the intake, start to erect a line of brattice reaching from the rib of the gangway, at *A*, a short distance into the first heading.

Extend this brattice gradually, giving the air passing around it plenty of time to remove the gas, as shown by frequent tests with the safety lamp. The brattice boards or canvas are nailed on the intake side of the posts, which are set two feet from the right-hand rib of the heading.

When the brattice finally reaches the last crosscut, *B*, that portion on the gangway, at *A*, is moved forward to *C*, so that the air now passes up this heading on both sides of the remaining brattice and, flowing through the open crosscut *B*, returns down the second heading to the gangway.

The brattice left standing in the first heading is now removed and work begun to deflect the air to the face of the first heading, by building a new line of brattice, starting from the outby rib of the crosscut *B* and extending gradually to the face of that heading.

When the face of the first heading is clear, the same method is employed to drive the gas from the face of the second heading, arranging the brattice as indicated in the figure.

Examination Questions Answered

Miscellaneous Questions

(Answered by Request)

QUESTION—*(a) What is a siphon? (b) Under what conditions can it be used? (c) In case a shaft, say 60 ft. deep, is located on a high mountain side, could a siphon be used to drain the shaft of water and, if not, why not?*

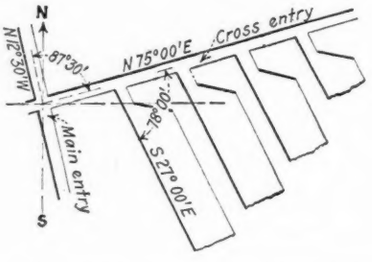
ANSWER—(a) A siphon is a pipe line having two branches of unequal rises united at the crown or highest point in the line, and forming a continuous conduit extending from an upper to a lower basin or pool.

(b) The conditions essential to the successful operation of a siphon are: 1. All joints must be air-tight and an air-trap must be arranged to remove air that accumulates at the crown. 2. Preferably both ends of the pipe must be submerged in the water. 3. The atmospheric pressure on the water in the upper basin must be sufficient to overcome the suction head, or vertical rise to the crown, and the resistance to the flow in that arm of the siphon. 4. The relative diameters of the pipe in the two branches must be such that flow in the intake branch, under atmospheric pressure, will be at least equal to the flow in the other branch under the discharge head. Otherwise, the siphon will shortly run dry.

(c) A siphon could not be used to drain water from a shaft 60 ft. deep, because atmospheric pressure, even at sea level, normally, is only equal to that of a water column of 14.7 ÷ 0.434 = say 34 ft. Practically, the suction head of a siphon, or vertical rise from the surface of the water in the supply basin to the crown of the pipe line, in feet, must not exceed nine-tenths of the barometric pressure, in inches. Thus, for a barometer of 30 in., the suction head of a pump or siphon should not exceed 0.9 × 30 = 27 ft.

QUESTION—(a) *The course of the main entry in a mine is N 12° 30′ W; what is the course of a cross-entry turned at an angle of 87° 30′ to the right? (b) What would be the course of rooms turned to the right off the cross-entry, at an angle of 78° 00′?*

ANSWER—(a) The course of the main entry lying in the northwest quarter, subtract the angle of its bearings from the angle at which the cross-entry is turned to the right, which gives for the angle of bearing of the cross-entry 87° 30′ — 12° 30′ = 75 deg. Therefore, the course of the cross-entry is N 75° E.



SKELETON PLAN OF MAIN AND CROSS-ENTRIES AND ROOMS

(b) To find the course of the rooms turned to the right of the cross-entry, add the angle at which these rooms are turned, to the angle of bearing of the cross-entry, which gives 75 + 78 = 153 deg. This is the azimuth of the course of the rooms. Since it lies in the southeast quadrant, in order to find the bearing of the rooms, subtract the azimuth from 180 deg., which gives the angle of the bearing as 180 — 153 = 27 deg. Therefore, the course of the rooms is S 27° E.

QUESTION—*If a man was injured from a slate fall that has broken some of his ribs on each side and also the collar bone and the man is unconscious, what would you do?*

ANSWER—Lose no time in sending for a physician. Then, with great care, lift the broken slate from the fallen body of the man and place him as carefully as possible on a stretcher, or otherwise remove him to a safer place where he will have good air. This being done, try to restore the victim to consciousness by sprinkling cold water in his face and applying smelling salts or spirits of ammonia to his nostrils. Keep the body warm and avoid any unnecessary movement of the injured one that would cause him pain and possibly start bleeding, by reason of the broken bones tearing the flesh or muscles. While waiting for the doctor it may be possible to apply a large triangular bandage about the chest to help support the broken ribs and prevent their movement.

The collar bone being broken, place a pad made of a large handkerchief, in the arm pit on the side of the injury, and bind the arm in a sling to give support to the broken bone, as far as this is possible. See that the patient has good air and is kept warm and make every effort to prevent collapse.

QUESTION—*Why is alternating current more dangerous to use in a mine than direct current?*

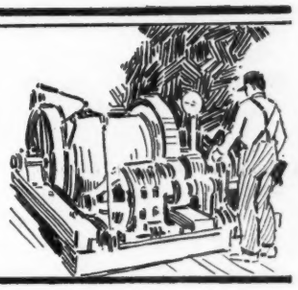
ANSWER—Contact with a live wire carrying alternating current is generally more fatal because of the rapidly recurring shocks produced on the nervous system, which is the nature of that kind of electricity. On the other hand, contact with a wire carrying direct current causes a single shock to the system, after which the current continues to flow steadily until the contact in broken.

QUESTION—*What precautions should be taken when transporting powder or permissible explosives into a mine in which electricity is used?*

ANSWER — All explosives should be taken from the powder magazine by a competent person in charge. This should be conveyed into the mine, in a special car or cars properly padded or otherwise protected against shock or possible electric charge due to accident on the road. All detonating caps or electric fuses should be carried in a separate container and kept away from the powder and other explosives. The powder car or cars should not be attached to a mantrip or one carrying timber and other supplies into the mine. Preferably, the powder car should be taken in alone.

Where the miners are permitted to fire their own shots only sufficient caps and explosives should be given to each miner for his day's work and these should be placed at once where they will be safe until used. Better practice, however, is to employ competent shotfirers who are authorized to charge and fire all holes that, in their judgment, are safe. This work should be done after the men have left the mine.

Increasing Output of Coal



Loading Machine and Method of Operating It So as to Move a Four-Hundred Foot Slab in a Day

Sides of Adjacent Rooms Slabbed Repeatedly Till 150-Ft. Pillar Is Drawn—Cutter Bar Enters Loosened Coal, Moves It to Conveyor, Which Deposits It in Car—In One Hour 150 Tons Have Been Loaded

By M. Martin*
Huntington, W. Va.

ROOM-AND-PILLAR methods of mining have militated greatly against the loading of coal by machines. This system at its best affords but a short working face, and to obtain as near 100 per cent efficiency as it is possible to get with any type of loading machine it is vitally necessary to provide a long working face on which the machine can load continuously over the side of the car. This will eliminate the two greatest time wasters machine loading has to contend with, namely, that of moving from one working place to another and of shifting the mine cars, with the attendant shutdown of the loader, while this change is being effected.

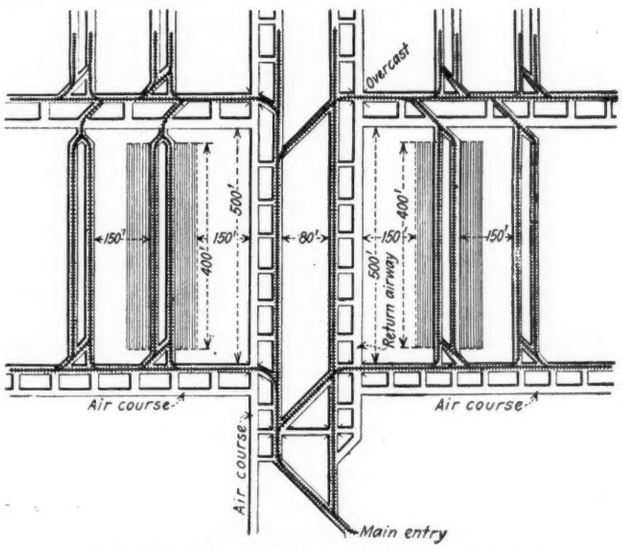


FIG. 1. LAYOUT FOR SIDE-WALL MINING

Two roadways are driven about 15 ft. apart and, including the approaches, 500 ft. long. When these are completed a 75-ft. slab is taken off the flank of each in 11 or 12 cuts. As the slabs on adjacent pairs of rooms meet the whole 150-ft. pillar which was left between room couples is mined out. The cutter then starts to slab the 15-ft. pillar between the twin rooms.

Most operators would say on first thought that the amount of money required to change their system of mining would be too great and the time required too valuable. A little study of the American System of Mining, as shown in Fig. 1, should relieve any doubt about the simplicity of the change and the time required to make it.

The system has its greatest economy in laying out a new mine, reducing the initial expenditure to a marked degree, the principal savings being on track, timber, ventilation and the concentration of the work, which in turn effects a saving in superintendence costs, as it requires a minimum number of men for that work. This system produces a much larger tonnage and a greater percentage of recovery than is possible with a larger area of development under the old system.

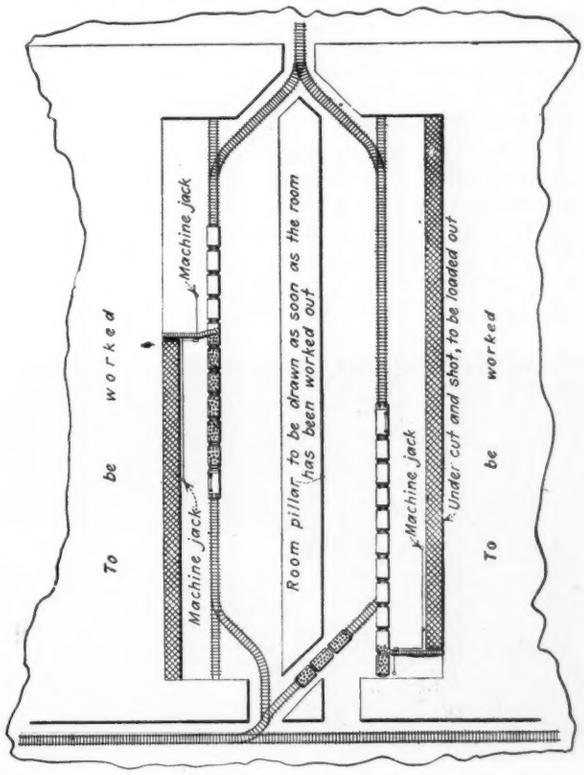

To be worked
Machine jack
Room pillar to be drawn as soon as the room has been worked out
Machine jack
Machine jack
Undercut and shot, to be loaded out
To be worked

FIG. 2. PLAN OF ROOM IN WHICH COAL IS BEING LOADED BY CONTINUOUS METHODS

Coal is mined from a long side wall; the loading machine then loads this coal into a trip of cars spotted by a locomotive. Cars can enter by one opening to the room and leave by the other.

*Vice-president and general manager, American Loading Machine Corporation.

The plan as outlined in this article and as illustrated in Fig. 1 involves the driving of parallel entries of regular width, leaving a small room pillar approximately 15 ft. wide between the two entries. This pillar should be pierced as often as is required by the mining law. A block of coal 150 ft. thick (to vary according to local conditions) is left on either side of these entries. Slabs are taken from these two blocks of coal in the manner illustrated in Fig. 2, the loading track being moved over each time to bring it within easy reach of the loading machine.

Upon reaching the centers of the 150-ft. blocks a return is made to the room pillar and a slab taken from either side. The steel is then removed and the room entries at either end are bratticed and work started on the next room. It undoubtedly is true that but few companies are willing to develop the entire territory before drawing the coal. In this event it is suggested that every other two blocks be worked, the alternate two being left for recovery upon return.

Speed Is of the Essence of Such a Plan

This work must of necessity be done with great speed, and can be done in the manner described only by the aid of mechanical loaders. A shortwall machine can slab a 400-ft. face in most coals in from three to four hours. After being undercut or topcut, as the case may be, the coal should be shot though not in the manner usual when the coal is loaded by hand. A light charge of power should be used—sufficient to disintegrate and separate the coal from the roof, leaving the coal in the position of a tight or standing shot.

After this is done the loader, shown in Figs. 3 and 4, is brought in, unloaded from its truck, sumped and fed in the same manner as is a shortwall mining machine. Cars are then brought in and continuous loading on a 400-ft. face begins. It is admitted that lack of continuity in the operation of a loading machine is one of its most serious drawbacks. With this machine a cut on a 400-ft. face can be loaded out in less than a union working day.

This machine is a comparatively new one, the one shown in the illustrations being the first of this type built. This loader was conceived and built in a coal mine by a practical miner, who has been in charge of mining at one of the large mines in West Virginia for fifteen years. In the forepart of Fig. 3 will be noted a horizontal bar 7 ft. long. Chisel-point bits are set in

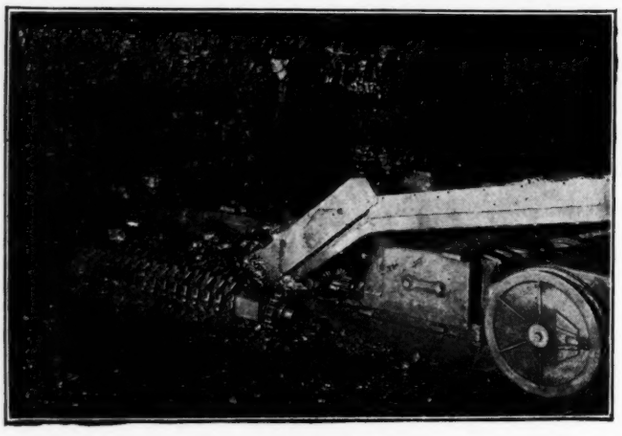


FIG. 3. AMERICAN LOADING MACHINE AT WORK
The horizontal bar 7 ft. long and covered with chisel bits rotating rapidly forces its way under the loosened coal and moves it toward the belt by which it is carried to the mine car.

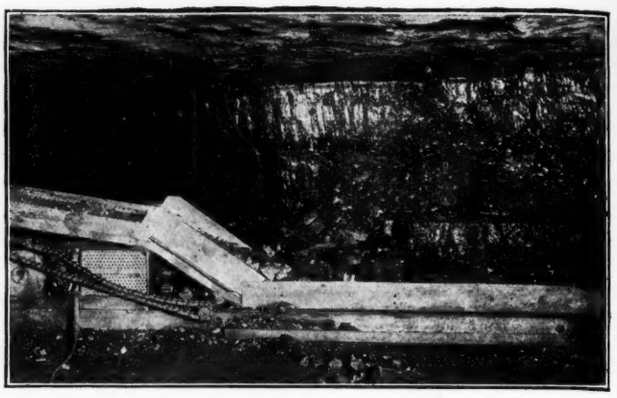


FIG. 4. VIEW OF MACHINE AS SEEN FROM BEHIND
The coal when lifted by the horizontal bar with the chisel points shown in Fig. 3 is thrown on the belt and kept from going further by the guard, which can be seen in this illustration as also in that just referred to.

lugs around the periphery of the bar, which rotates at a speed of 240 revolutions per minute up and toward the conveyor, which will be seen running up and over the motor, whence it discharges into the mine car on the track parallel with the face.

The propelling power of the original machine was an old type of standard shortwall machine. This has now been changed to a new and improved design, eliminating a number of superfluous gears and shafts as well as some unnecessary weight, but retaining the shortwall-propelling principle. The operation is similar to that of a shortwall mining machine. The loader is sumped and fed as if it were to be used for cutting.

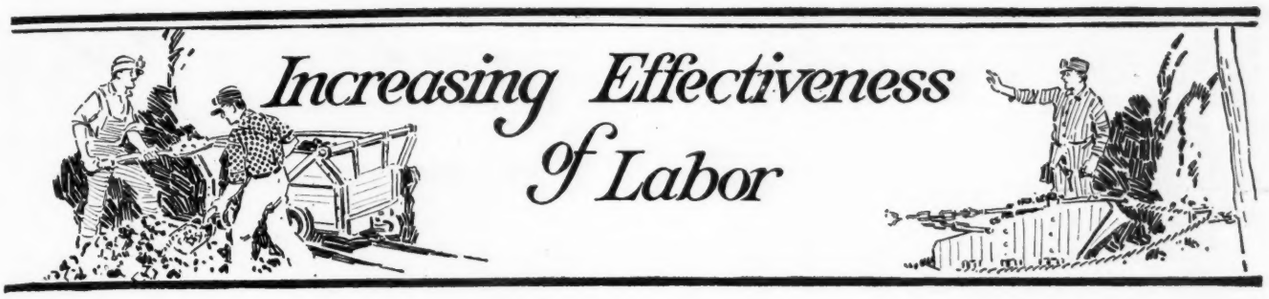
The height of the coal governs the loading capacity of the machine. The machine moves along the floor at a varied speed of from 1 to 48 in. per minute while loading; it is quite easy, therefore, to figure its capacity in any seam of coal. The speed with which the machine loads is controlled by friction in the same manner as the shortwall machine.

Machine Scrapes up Bottom Coal Clean

After the first cut in a room or entry has been loaded out it is necessary to scrape the bottom; after that the machine makes its own bottom by scraping it for a depth of from one to three inches, according to the manner in which the bits are set. This does not require any special adjustment nor does the machine consume any more power in performing the work of scraping the bottom, which generally is conceived to be one of the most annoying problems to be met in a mine which undercuts the coal.

The loader shown in the illustrations has been in operation at the mines of the Buffalo Eagle Colliery Co., Braeholm, W. Va. The later type of machine, embodying all the principles of the one shown in this illustration but somewhat different in design, will be put upon the market soon. The new machine will be able to load successfully in a coal bed less than 30 in. in thickness.

Briefly summing up, this machine is operated like a shortwall mining machine, will load any coal cut by one of these machines, travels from place to place on a truck, is loaded and unloaded by its own power, requiring no special operator; it scrapes the bottom and has in a 6-ft. seam loaded coal at the rate of 150 tons per hour. This machine is now being manufactured by the American Coal Loading Machine Corporation, Huntington, W. Va.



Refuse-Stacking Car, Making Pile Sixty Feet Wide, Much Reduces Labor of Dumping and Track Shifting

A Larry and a Rapidly Moving Conveyor Mounted on a Turntable Truck Make It Possible for One Man to Dispose of All the Rock Coming from a Large Mine

By A. F. Brosky
Pittsburgh, Pa.

AMONG the many costs in and around mines that can be greatly reduced is that of refuse stacking or slate dumping. When much slate has to be disposed of, several men and a few mules are constantly employed at this work, and many coal cars lie idle awaiting the disposal of the slate which they contain, making it necessary to have more mine cars that would otherwise be required.

A refuse-stacking car or larry is being manufactured that is capable of handling a large amount of refuse at a low cost. This device strongly resembles an ordinary coke larry, except that it is provided with a conveyor beneath the hopper and a turntable between the truck and the superstructure. The hopper has a capacity of seven tons and the turntable is power-actuated through a clutch from the motor by which the conveyor is driven.

Rock Spread by Rapidly Running Conveyor

The material is delivered from the hopper to the discharge apron through a suitable gating arrangement. The discharge conveyor, made of manganese steel, travels at a speed sufficient to throw the material 20 to 30 ft. beyond the conveyor end. It discharges at the rate of five tons per minute. All four wheels are drivers, power being furnished by a 30-hp. 230-volt direct-current motor. This car will discharge refuse to either side or to the front. When loaded, it has, on straight track with a 6-per cent adverse grade, a speed of 400 ft. per minute. All operations are controlled from a platform that is installed at the rear end of the car.

Small mines especially, but a few large ones as well, continue the old-fashioned method of stacking refuse; the material is brought to the dump in cars and is discharged by tipping the ends of the wagons by means of a small crane. To dispose of, say, 150 tons of slate each day in this manner may require from ten to twelve men. In many cases a mule and a driver are necessary to transport the pit cars to the dump. Thus the dumping of the rock requires about the same number of men as are employed on the tipple to dump and prepare the coal, although this is many times the volume of the slate that the same mine will stack.

Nor do the disadvantages of this method end here, for the dump track must be shifted frequently. This last item is perhaps the most costly of the entire operation. To stack a pile 60 ft. wide at the top by the old system would necessitate at least six shifts of the spur track, whereas this refuse-stacking car will at one track set-up make a fill of this width. In order to dispose of the greatest amount of rock with the least amount of track shifting it is necessary first to build up a high narrow pile. Fig. 1 shows a refuse pile stacked by the old and by the new systems, using a one-track set-up.

For purposes of calculation the angle of repose of slate may be considered as being 45 deg., this being sufficiently accurate for all practical purposes. The cross-hatched portion of the trapezoid of Fig. 1 represents a section through a refuse pile as made by the old system. This is superimposed upon a cross-section of a pile made by the new mechanical method. A simple mathematical calculation, using the dimensions indicated, shows that the mechanical method gives a cross-sectional area of 2,700 sq.ft., whereas the old method yields an area of only 1,200 sq.ft. Thus from a single stationary track the refuse-stacking car can dump more than twice as much material as can be dumped by the old method. To discharge as much refuse by the old scheme as may be discharged by the new would require the track to occupy successively, in the first instance, six different positions, figuring a width of 10 ft. for each track set-up at the top of the pile.

In the Pittsburgh district mine refuse may be piled

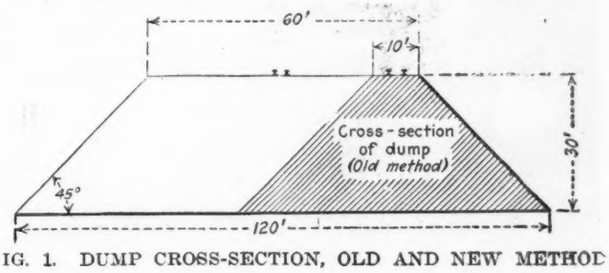


FIG. 1. DUMP CROSS-SECTION, OLD AND NEW METHOD

The cross-hatched area shows the old form of dump, where the gallows frame is used and the dump is hand-trimmed in spare moments. The large area shows the new dump, which though more saving of labor in low rock piles is a large source of economy in all, high or low.

to any convenient depth without any great liability to firing. In some places, however, as, for instance, in Cambria and Indiana counties, of central Pennsylvania, where refuse-pile fires are common occurrences, good judgment must be used in determining the depth to which a pile may safely be carried. In such localities as few things are more annoying than the smoke from dump fires, the town must be so situated as to be out of the path of the wind that prevails over the dump.

Handling the refuse by means of a stacking car enables the rock to be well spread, thus making it possible to build low dumps and to reduce the risk that such fires will occur, the exact cause of which has not been definitely determined. It does not at first seem likely that these fires originate from spontaneous combustion, because to a casual observer they seem comparatively free of inflammable material. However, there is always a certain amount of coal and bone which reaches the dump, and most shales in the coal measures contain an appreciable quantity of oil. Moreover, broken timbers frequently are placed in slate cars and removed to the surface. In places where such fires start, whether originating from spontaneous combustion or from forest fires, blacksmiths' ashes, dumpmen's stoves, discarded wicks, or some other cause, there is always sufficient inflammable material, frequently including pyrite, to sustain them.

Shallow Piles Less Likely to Catch Fire

In order to decrease the probability that these fires will be started, supposing that they are caused by spontaneous combustion, the piles should be shallow and wide rather than deep and narrow. In high piles but little radiating surface is provided and a comparatively heavy load is imposed on the material at the bottom of the pile. This may intensify the heat which the oxidation of the inflammable constituents generates.

It has been found in Indiana County that if shallow piles are made and allowed to weather and disintegrate for one year, a second layer of the same depth as the first may be placed upon it with safety. If the slate stacker is used in such a case it will be necessary to shift the track, at the oftenest, only once a year.

The Valley Camp Coal Co. has one of these refuse-stacking cars at its Soudan mine at Van Voorhis, Pa.

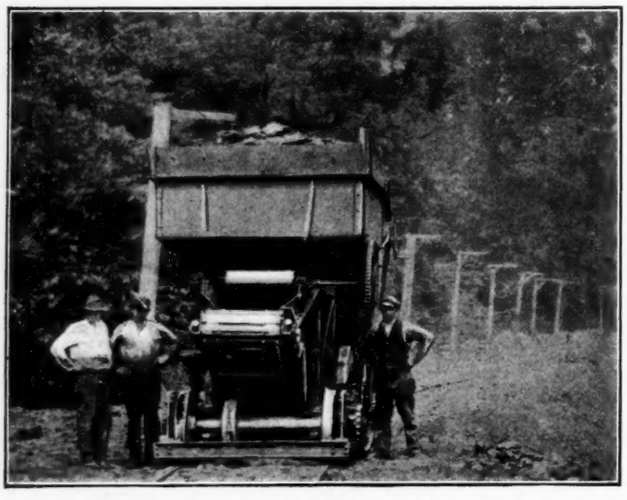


FIG. 2. ROCK STACKER ON ROAD OF ITS OWN MAKING

Stacker holds seven tons and on a straight track up a 6 per cent grade has a speed of 400 ft. per minute. Note the width of the fill and the evenness of the road. A narrow fill is difficult to maintain.

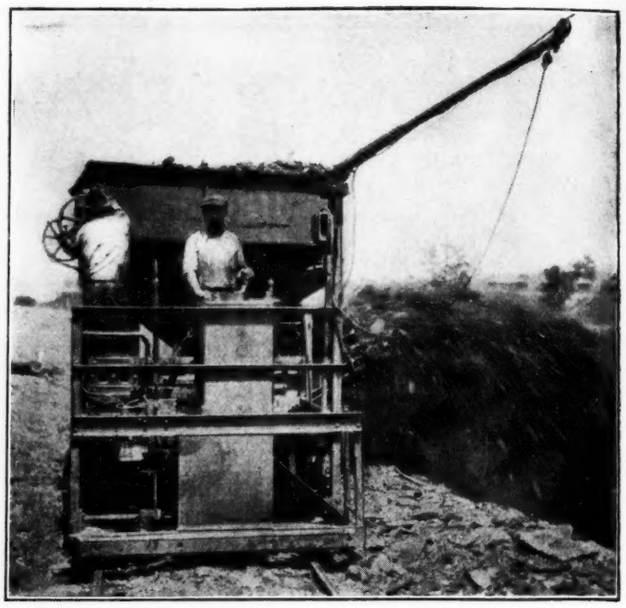


FIG. 3. CONVEYOR WIDENING A FILL—ON THE RUN

In this case the work is being done by two men, one arranging the feed and another driving the car. The throw is dependent on the speed of the traveling apron

This machine has been in operation for more than four and one-half years and has given excellent service. The length of haul from the refuse hopper on the tipple to the dump is somewhat more than 3,000 ft. In that distance adverse grades as steep as 4 per cent are negotiated by the stacking car without apparent difficulty.

An average of four round trips are made every hour, or thirty-two trips in an eight-hour workday. As the hopper capacity is seven net tons, 160 tons of refuse can be stacked during a single shift. Although 70-lb. rail is recommended for greatest efficiency, this company uses a 50-lb. rail for its track and it has nevertheless not experienced a single derailment.

Side-Dump Trailer Will Be Added

That this machine has an appreciable drawbar pull was evidenced at this mine when the slate stacker, being coupled to a railroad car half filled with coal, pulled it for a considerable distance over level track. The results of this test suggested an idea to the officials of the mine. There are times when more than the usual amount of refuse must be disposed of in one day. To meet such emergencies the company is obtaining an ordinary contractors' side-dump car, which will be attached to the stacking car as a trailer. The exact capacity of this trailer has not been decided upon as yet. As the stacker is not required to yield its greatest output now, when disposing of 160 tons in eight hours, the company believes that the machine with the trailer will be enabled, when occasion demands, to dispose of nearly 275 tons of refuse daily.

Advantages possessed by this refuse-stacking car may be summed up as follows: (1) One man loads and unloads all slate; (2) the rock can be discharged 30 ft. from the center of the car, and thus it builds up its own fill; (3) the refuse may be deposited ahead or upon either side of the car; (4) it builds a dump 60 ft. wide from a single track position. The machine as here described is manufactured and sold by the Heyl & Patterson Co., Inc., of Pittsburgh, Pa.

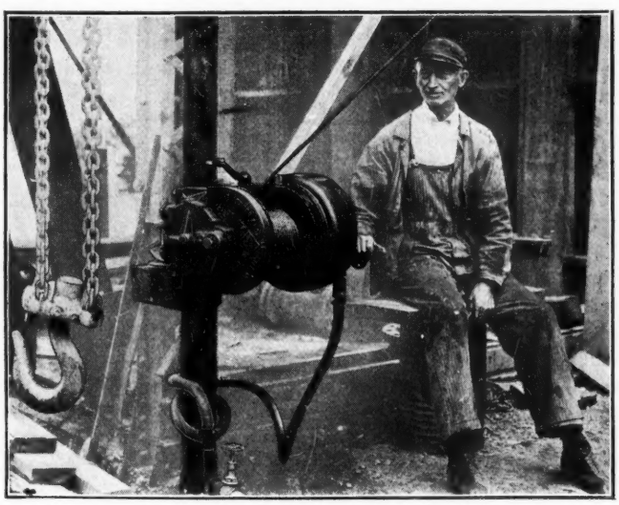
The ease with which the dumping is done is greatly

in its favor. It is difficult today to obtain and retain dump labor where the old strong-arm methods in the glare of the sun are still pursued. Finding men for this job when some of those on regular duty have laid off or left is one of the most vexatious duties of the mine foreman. Where there has been a heavy run of rock over night the shortage of men and the overplus of cars to be dumped may almost lay a mine idle in the earliest and most productive hours of the day. The slogan used to be "Do it yourself if you would have it done," but a better motto is "Make it easy and there will be men enough to do it, and they won't want watching."

Waughoist, Driven by Rotary Engine, Though Light, Is Powerful

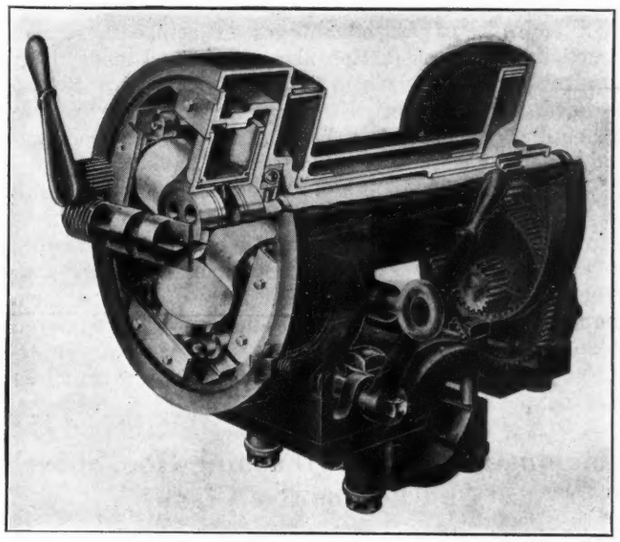
AS EVERY mining man knows, a light yet powerful engine or motor capable of exerting a strong pull on a rope or cable always is convenient and sometimes well nigh indispensable about a mine. The uses to which such a machine may be put are many, a few of them being as follows: Hoisting (or lowering) cars to or from the working face in a mine room, replacing cars off the track, pulling cars up or lowering them down a grade on a heading or gangway, dragging timbers up slopes where no track is laid or through break-throughs or other narrow passages, hoisting timbers in manways or chambers opened in steeply pitching coal, thus greatly enhancing the effectiveness of mine labor and enabling one or more men to do the work of many. Where cars leave the track the replacing of them promptly may save a half hour's time for the whole mine day force and prevent the miners from going home on short time. The few men at the wreck can quickly rerail the good cars and derail those which should be left for later attention. The machine may also be used in pulling props or other timbers, the operator being in safety from falling roof while actual withdrawal takes place.

To meet these and similar uses both under and above ground the machine shown in the accompanying illustrations has been placed upon the market. The principle upon which the engine operates is essentially identical with that of any ordinary single-acting steam or air engine, except that many inversions have been made. In order to obtain compactness and simplicity all connecting rods and crossheads have been eliminated and their functions performed by other means. Two elements only rotate. These are the cylinder block containing the pistons and the spider together with its shaft. The cylinder block is composed of four cylinders, cast integral, and equally spaced 90 deg. apart. This is mounted on a stationary hollow shaft through which compressed air is led to and exhausted from the machine, the air being controlled by suitable ports. Thus the cylinder block is free to revolve around an axis perpendicular to the plane in which reciprocation of the pistons takes place.



WAUGHOIST MOUNTED ON A PIPE POST

It can, however, be attached to either a wood post or other timber, if such be available. This hoist has the advantage that it takes almost no room and can readily be moved from place to place.



HOIST IN PARTIAL CROSS-SECTION

The cylinder block is composed of four cylinders cast integral and spaced 90 deg. apart. These are mounted on a hollow shaft through which compressed air is led and exhausted from the machine.

Enclosing this element and revolving in synchronism with it is the spider, which really is the inverted crank of the ordinary engine. Essentially the spider is a hollow box with four flats equispaced about its internal perimeter. These flats take the thrust of the engine pistons. Integral with the spider is a shaft supported in suitable bearings. This forms the axis about which the spider revolves. It is parallel with but eccentric to the axis of rotation of the cylinder block.

When the opening, or port, in the bottom of one of the piston cylinders registers with the live-air port in the axle, air enters the cylinder and the piston exerts pressure against the flat surface of the spider against which its outer end bears. Because of the eccentricity of these parts, as above mentioned, rotary motion of the spider carrying the cylinder block with it is produced. After rotating through an angle of about 180 deg. the cylinder uncovers the exhaust port in the axle and the air is released. In the meantime the opposite cylinder has rotated to the point where it begins to receive air and exert power. Thus turning effort of the machine is practically uniform.

Instead of connecting rods the pistons are provided at their outer extremities with rollers, permitting easy transverse motion between the piston and spider flat against which it bears. To keep the rollers and pistons from dropping away from contact with the spider a plate is employed that engages with a tongue along the lower edge of the piston, holding these parts together.

In addition to the advantages of compactness and simplicity, the construction above described lends itself admirably to the splash system of lubrication. It also permits of high speed without objectionable vibration. All engine parts run in a bath of oil and reciprocating and revolving members are carefully balanced.

This engine, known as the "Waughoist" and built and sold by the Denver Rock Drill Manufacturing Co., of Denver, Col., is so designed as to be fastened readily to a post or timber either under or above ground. When so mounted it may be effectively used to perform the many operations of hoisting and pulling encountered in and about the mines. Of course, back gears are interposed between the engine shaft and winding drum, as may be seen in one of the illustrations.

Combination Steam Trenching Hoe. Shovel And Locomotive Crane

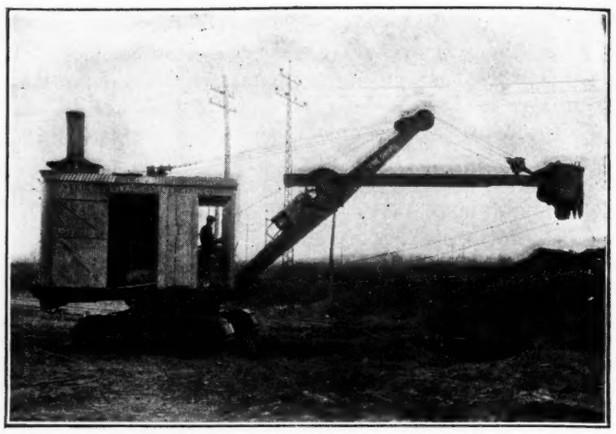
AFTER nearly five years of study, experiment and test upon a patented device for trench excavation, a machine called the steam hoe has been perfected. This might be described, in a homely way, as a "back-acting steam shovel," for the dipper moves toward the machine in digging, and fills with a "hoe" motion, instead of being hoisted upward and outward.

This difference in digging motion is important in many kinds of excavation, particularly trenching. As the dipper is loaded by pulling in toward the machine, the steam hoe backs away from the ditch it digs. Thus it always remains on solid ground, instead of being supported upon a platform over the excavated trench, as a steam shovel must necessarily be supported. This ability to work on solid ground is of particular advantage in soft or sandy material. When excavating in such ground, a steam shovel, its weight carried by the sides of the trench, is delayed by many cave-ins. This machine not only obviates most of the caving but eliminates much trench bracing.

While this machine is especially adapted to soft and sandy soils, it is capable of the hardest kind of trench excavation, such as cutting through stiff shale or large boulders. This work requires all the strength and power of a steam shovel, which the steam hoe possesses. It is equipped with a 22-ft. dipper handle, and digs a trench as deep as 14 ft. When operating to this depth it is wise to carry the boom at 40 deg. with the horizontal. At this angle the machine with the length of dipper handle above mentioned can dump material 13 ft. 9 in. above grade and 33 ft. from the pivot shaft.

MACHINE IN USE AS TRENCHING HOE

Pulls the dirt toward it and so does not have to straddle the ditch. The caterpillar moves it backward as the cut is completed. Dipper stock is 24 ft. long.



WORKING IN CRUMBLY MATERIAL

Acting by a pull instead of a lift it will work in crumbly material and, resting well back of the cut trench, there is no tendency to cause the sides to cave.

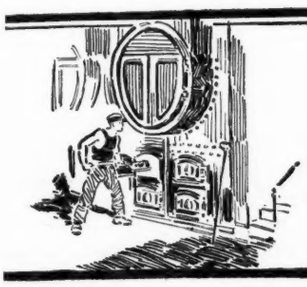
When operating in ordinary materials such as earth or gravel this machine easily gives an output of 200 to 300 cu.yd. per day in trench excavation. It is quick-acting and is provided with the same simple control that has proved its efficiency on the steam shovel. It may be furnished with either traction wheels or caterpillar type of mounting, the two being interchangeable on the same truck frame.

Another valuable feature of this machine is its ready convertibility to either a steam shovel or a locomotive crane. Each of these machines can be quickly and easily changed over to a steam shovel, or in less than half a day's time it can be converted into a locomotive crane handling a clamshell bucket for such work as loading or unloading cars, deep excavation, etc. As a crane it gives excellent results with either a dragline or orange-peel bucket. This machine is built and marketed by the Ball Engine Co., of Erie, Pa.

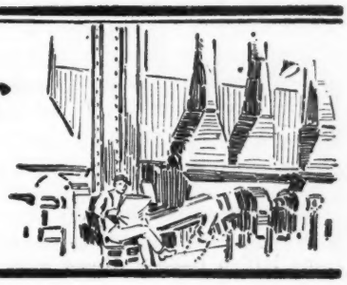
Vacuum Used to Suck Coal out of Barges

THE vacuum process has recently been applied to the unloading of coal, barges at the City of London Electric Supply Co.'s Bankside depot being discharged in that manner, says the *Colliery Guardian*. On the wharf a tower 65 ft. high has been erected with platforms at various levels. On the uppermost of these a receiver is placed, from which flexible piping extends down into the hold of the boat to be unloaded.

One section of the receiver is connected with a vacuum pump which exhausts the air, thus sucking up the coal from the barge to the receiver. Only filtered air reaches the suction pumps. From the receiver the coal drops through a double compartment airtight box into an endless belt which conveys it to the storage bunker or to trucks. Coal up to 4 in. in diameter can be raised and 60 tons per hour are dealt with by each of the two plants at work.



Lowering Power Losses



During a Momentary Peak Load the Feed-Water Supply of a Boiler Should Be Automatically Curtailed

Carrying the Water in a Boiler at a Uniform Level Does Not Result in the Greatest Efficiency—A Suitable Automatic Feed Regulator May Be Made to Control the Rate of Feeding so That Dry Steam and Best Results Are Obtained

By Roland Moeller

BOILER-FEED regulation originally aimed at keeping the water level in the steam generator as nearly constant as possible. Later, about the year 1912, it was realized that keeping the water at a uniform level at all times had marked disadvantages. Prior to that time, automatic boiler-feed regulation gave an irregular, intermittent feed, which, in so far as its effect on the generation of steam was concerned, was not much of an improvement over hand regulation. While a mechanical device that is absolutely reliable has never been built, many automatic mechanical contrivances are far more reliable than a human being, especially where the apparatus is given a reasonable amount of care and attention. It is for this reason that a water regulator properly designed will add much to the safety of operating a plant.

Rate of feed-water flow into a boiler has a notable effect upon its steaming capacity. A full opening of the feed-water valve may pass enough cold feed water into the boiler to absorb all the heat evolved in its furnace without generating any steam whatsoever. Intermediate rates of feed, of course, reduce the steaming capacity of a boiler in proportion to the feedwater flow.

At Peak-Load Period Feed Should Be Reduced

It is evident, therefore, that frequent periods occur in the operation of a boiler when it would be desirable to reduce the rate at which water is fed so as to make possible the maximum generation of steam. This is particularly true after a period of low load when a sudden peak comes on. Under these conditions the furnace must be given time to catch up with the new peak load, and if, meanwhile, the rate of feeding is temporarily reduced, the boiler has a far better chance to meet the sudden increased demand for steam if little heat is being consumed in bringing the feed water to the boiling point.

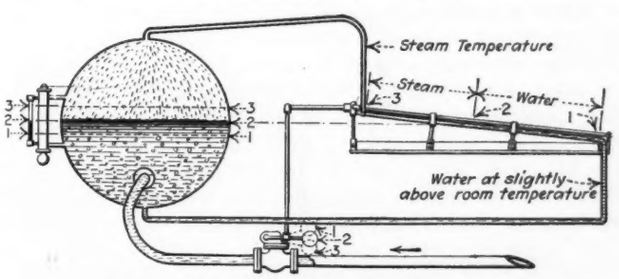
On the other hand, should the load suddenly drop off, it takes some time for the furnace to slow down its operation until it generates heat at a rate commensurate with the new load conditions. It is then desirable to increase the rate of feeding temporarily so as to absorb the extra heat generated by the furnace during this brief period.

Again, where a number of boilers are operated together, fewer units can be made to do the work if scientific feed-water regulation is employed. With such regulation all the boilers deliver their maximum output, the rate of feed-water flow being reduced to a minimum in all of them at the same time to make this possible.

Under Normal Load Feed Should Be Steady

An automatic feed regulator should, then, feed continuously as long as there is a steady load on the boiler. It should temporarily reduce the rate of feed flow when a sudden increase in load occurs and temporarily increase that rate when the load suddenly decreases. It should keep the water level high under low loads and low under high loads. During periods of steady steaming it should maintain a constant water level by maintaining a constant rate of feed proportionate to the load. During gradual changes in demand it should adjust the rate of feed in proportion to the changes in the load.

A device which functions on these principles acts as a kind of compensating boiler governor. It supplies the means of absorbing the excess heat generated by the furnace during the brief period following a sudden decrease of load when the furnace has not yet had time to adjust itself to the new conditions, and prevents absorption of heat by the feed water when the furnace has not had time to catch up with a sudden increase in



REGULATOR FOR SUPPLY OF WATER TO BOILER

The level of the water in the long inclined tube on the right rises and falls with the height of the water in the boiler. When the level of the water falls by reason of low demand for steam the part of the tube exposed to steam heat is lengthened and the tube expands, operating the valve so that it admits a little more than the normal quantity of water. Whenever the level of the water in the tube rises because the height of water in boiler is raised by an increase in steam demand, the length of the steam section of the tube is decreased and the tube contracts closing the valve through which the boiler is being fed. Thus water is supplied to the boiler most freely during periods of small steam demand and not at points of peak load.

load, and when all the heat generated is required for steam making. It utilizes the volume represented by the difference between high- and low-water marks as a kind of neat reservoir, and so regulates the water level as to insure dry steam at all times. It guards also against damage arising from too high or too low a water level.

Water Level Changed by Rate of Steaming

It has been conclusively demonstrated that the water level in a steaming boiler undergoes pronounced fluctuations which bear a direct relation to the rate at which steam is being produced. This is because of the increased number and volume of steam bubbles present in the water when the boiler output is high. This variation of water level according to load is one of the characteristics of steam boilers utilized in the type of regulator shown diagramatically in the accompanying illustration.

A regulator of this construction is extremely simple, consisting merely of a straight inclined tube, a lever, a heavy iron base, and a rugged, balanced, practically frictionless regulating valve. Such a device is easily adjusted to maintain the water level between any desired limits. The connections to the boiler, as may be seen, are extremely simple.

The metal tube mentioned has a large coefficient of expansion and is connected to the boiler in such a way that the level of the water in this tube varies with that existing in the boiler. The water in the lower end of the tube not being exposed to any source of heat, becomes comparatively cool, and the upper end or that portion above the water is kept hot by steam from the boiler. As steam slowly condenses in the upper part of the tube, it is returned to the boiler through the lower connection.

Feed Change for High Load Only Temporary

If the water level in the boiler suddenly rises because of an increase in load, the level of the water in the tube also rises and the length above the water containing hot steam is reduced. If, on the other hand, the water level in the boiler falls because of a decrease in load, the length of the tube exposed to hot steam is increased by the amount that the water recedes. The portion of the tube that is exposed to the hot steam is increased by the amount that the water falls. That portion of the tube expands owing to the heat of the steam and to the greater length that is thus exposed. This increases the over-all length of the tube. This difference in length between high and low water is utilized to operate a valve which controls the rate of flow of the feed water.

When a sudden increase occurs in the demand for steam, the water level in the boiler rises. The length of the tube exposed to steam is decreased and that exposed to water is increased. Consequently there is a contraction and the over-all length of the tube is lessened. This in turn reduces the opening of the feed-water valve. If the high load continues, the height of the water in the boiler will, of course, gradually drop off until the water level in the tube comes to a point where the feed-water valve again begins to open.

The opening increases gradually until a uniform rate of feed is reached which is equivalent to the rate at which the water is evaported in making steam. If the demand for steam is high, the demand for feed water is high, and the valve must have a wide opening. In order to obtain this, the tube must be expanded. This in turn can be brought about only by a lower water level, which is exactly what is desired under high-load conditions.

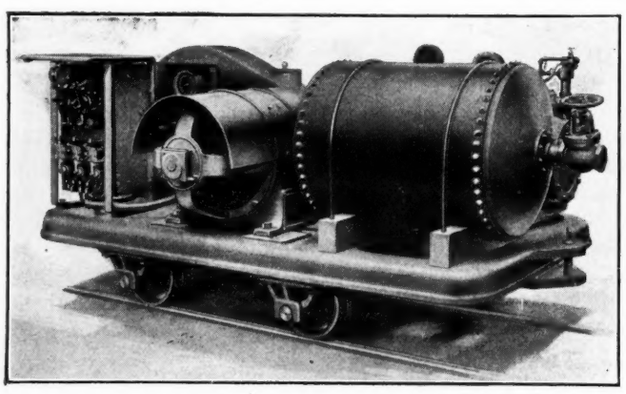
If, on the other hand, the demand for steam suddenly drops off after a continued heavy load, the water level in the boiler falls immediately, and with it the level of the water in the tube. The length of the tube exposed to hot live steam is thus increased, causing an increase in its over-all length. This in turn opens the feed valve so as to admit water to the boiler at an increased rate until a level is reached higher than that existing under high-load conditions. To reduce the flow of feed water to conform to the lessened demand for steam the opening of the feed-water valve must be decreased to less than it was when the demand for steam was high. To accomplish this the thermostatic tube must contract. It does this only with a rise in the water level. Higher water level during periods of low load is desirable for heat-storage purposes and is entirely permissible with light loads.

Typical time-temperature charts before and after installation of these automatic thermostatic boiler-feed regulators have shown an average feed-water temperature under hand regulation of 178 deg. F., which was about the best obtainable, while automatic regulation resulted in an average feed-water temperature of 210 deg. F. The average feed-water temperature was therefore increased 32 deg. F., which is equivalent to a saving of 3 per cent in fuel.

Power Saved by Automatically Stopping Compressor When Air Is Not Needed

THE usual method by which constant pressure is maintained in a compressed-air system is by "unloading" the compressor—that is, by allowing it to run idle (without delivering compressed air) during those periods when the air required is less than the compressor can deliver. Where machines are driven by electric motors, much power is wasted during such times of resultless operation. This can be saved by providing the machine with an automatic electric starting and stopping device so arranged that the motor will stop immediately the load is thrown off the compressor and start again when the demand for air increases.

Such an automatic control can now be furnished for belted, motor-driven air compressors. It takes the shape of a self-starter and pressure regulator, working in connection with a differential unloader. This appa-



PORTABLE COMPRESSED AIR OUTFIT WITH AUTOMATIC STARTING AND STOPPING DEVICE

Small units instead of large ones and their remoteness from the power house have made it difficult to adjust compressed-air output to meet varying demand and to find men who will conscientiously shut down a compressor when it is not needed. The irregularity of demand cannot be cured where units are small but by the device described in this article the delivery can be balanced to meet demand and the power hitherto wasted may be saved.

ratus automatically shuts off current from the motor the instant after the compressor has been "unloaded," and automatically starts it again when the pressure in the air system falls to a predetermined level. The control operates in such a manner that the motor in starting attains full speed before load is thrown on the compressor. Thus all danger of burning out the windings or other electrical connections is eliminated.

The entire apparatus is of rugged construction and built to withstand long and severe operating service. The adjustment for pressure is accurate and reliable. Pressures either above or below that of the atmosphere can be accommodated.

The self starter employed with direct current is made for use either with or without a knife switch and fuses. It is of the magnetic lockout type, consisting of a series of ruggedly constructed clapper-type contactors with series coils, so designed that each accelerating contactor is magnetically prevented from closing until the motor current has fallen to a predetermined value. A main contactor of the clapper type, equipped with a powerful magnetic blowout, is provided for opening the motor circuit. The resistor material consists of flat cemented units in the small sizes, and cast-metal grids in the large sizes.

The alternating-current self-starter is of the primary-resistor type and can be supplied with either open or enclosed panel. It has time-limit acceleration and low-voltage protection. Two double-pole contactors and a solenoid-operated, dash-pot timing relay are provided. One contactor connects the motor and starting resistor to the supply lines, the other short circuits this resistor after the lapse of a definite time interval determined by the relay.

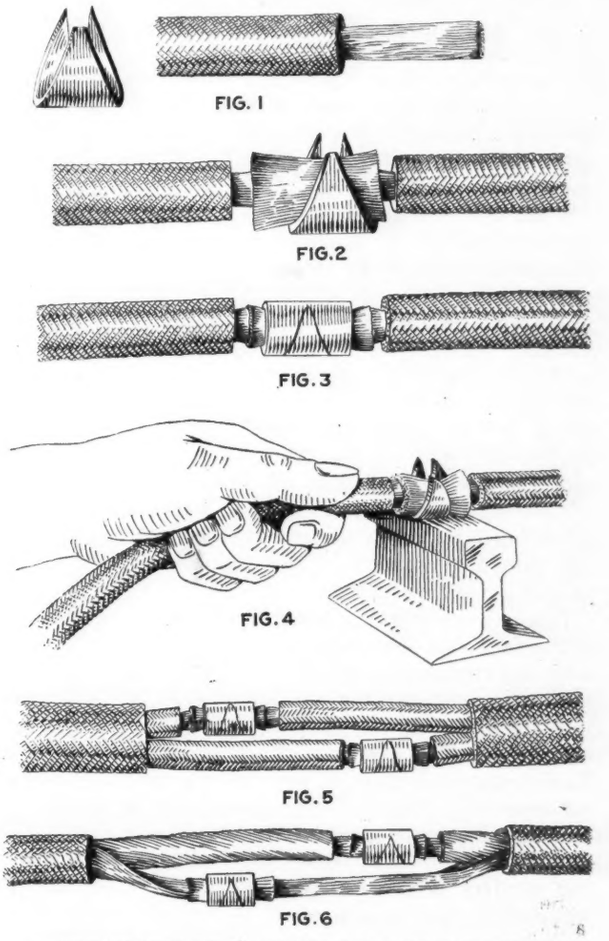
The self-starter is controlled by a pressure regulator that may be of either the diaphragm or the gage type. The former is suitable for pressures above that of the atmosphere only, while the latter can be used under either pressure or vacuum. Both types can be employed with either alternating or direct current. The diaphragm type has a quick-break switch, its current-carrying parts are covered and the diaphragm is of rubber. It operates at pressures from 1½ to 175 lb. per square inch.

The gage type has silver contacts which handle the pilot circuit of a relay which in turn carries the pilot circuit of the automatic starter. Adjustment can be made for a pressure range (between starting and stopping) as low as 5 lb. per square inch in a 100-lb. air system. The regulator operates at pressures ranging from a 30-in. vacuum to 1,000 lb. per square inch above the atmosphere. This automatic control can be provided by the Chicago Pneumatic Tool Co., of 6 East 44th St., New York City, with its compressor equipment.

Strength of Cable Splice Made by Hammer Exceeds That of Cable

CABLE-REEL locomotives and cutting machines have one weak spot—the cable. They would get better service if only the cable were more rugged and if the splicing, when necessary, as it so frequently is, were electrically more perfect, more easily made and stronger when made. The locomotives and cutting machines approach perfection but the cable as often supplied needs improvement. The result is that the locomotive and cutting machine get low voltage, the work of the machine cutter is delayed and he is subject to shock. To meet this the Newberry cable splice or, rather, connector, has been devised and is being made by the Huntington Cable Splicing Co., of Huntington, W. Va.

A short length of cable is cleared of insulation on either side of the break. The two free ends, being freed of twist by a few light blows, are pushed together as are the bristles of two brushes, so that the wires of the two ends are brought in close proximity. The splice or clip is slipped sideways over the wires thus bunched and is closed by a few blows of a hammer where the number on the splice appears, the rail being used as an anvil. By this means the tongue enters the V cut in the splicer. By turning the cable and



A FEW BLOWS OF HAMMER MAKE CABLE SPLICE

At an exhibit in the exposition at Huntington recently a cable thus repaired was pulled apart and it broke at a point remote from the splice, showing that the repaired part had a strength greater than that of the original cable.

striking the connector the splice is made perfect. All that is then needed is a piece of insulating tape.

The same arrangement can be used with a concentric cable and with terminal bonds, only here steel is used instead of copper, so that the splice can be welded to the rail. In splicing concentric or duplex mining-machine cables care must be taken to cut the cable so that the two splices will not come opposite each other. Care must, of course, be taken to see that in removing the insulation the wire is not cut. The connector used must be of a size suited to the cable. By slipping in a few extra wires an over-large connector can be used but it is better to procure one of the proper size.

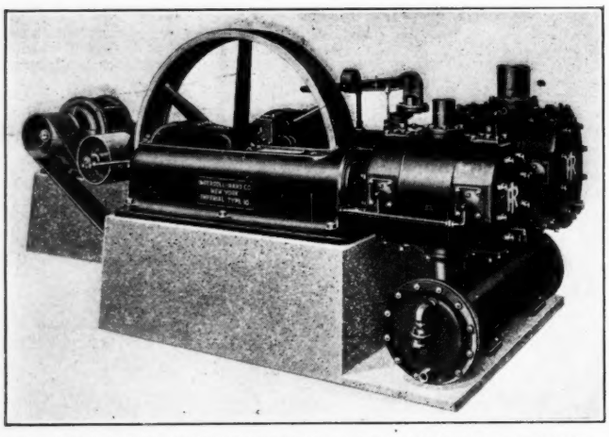
Five-Step Control Adjusting Work to Load Prevents Power Waste in Compressors

IN THE COURSE of a day the demand for compressed air varies considerably and with any given invariable clearance, speed and stroke the output of the compressor remains constant, causing an immense waste of power at low-load or no-load. The stroke cannot readily be varied, but by regulating the clearance the stroke can be made with a reduced consumption of power by reason of the reduction in the discharge. The time is past when compressors must be so built that they can run only at full or no-load when the demand for air fluctuates.

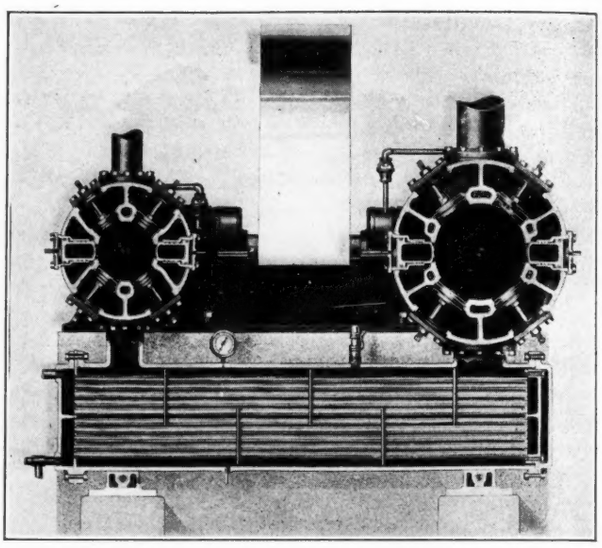
Clearance control has been employed with entire success in the larger sizes of direct-connected electrically-driven compressors built by the Ingersoll-Rand Co., of 11 Broadway, New York City. Many of these larger machines have been installed where more than 600 cu.ft. of free air are required per minute and direct motor drive is employed. This control assures efficient operation at partial loads.

With this clearance control the compressor is automatically loaded or unloaded in five successive steps, these being obtained by suitable reductions or increases in the clearance space of the air cylinders. The compressor will accordingly operate at full, three-quarters, one-half, one-quarter or no-load. The design is such as to obtain effiicent operation at any partial capacity, the input in power required being approximately proportional to the output demanded. This control is entirely automatic. If the machine is operating at full-load and the demand falls off, the control unloads the compressor, causing it to run at a partial or no-load point until the demand for air becomes larger, when the control automatically increases the load in the proper successive steps.

One extremely valuable detail of this type of control is the fact that the clearance pockets are made integral with the compressor cylinder and the entire regulation is obtained by varying the amount of free air drawn into the cylinder for compression. By this means no loss of power arises from wastage of air or leakage. The clearance pockets at the ends of each cylinder are automatically thrown into communication with the cylinder in proper succession, the process being controlled in accordance with predetermined variations in the receiver pressure. When the compressor operates at partial capacity a portion of the air is compressed into an added clearance space instead of being forced through the discharge valves. On the return stroke this air expands, giving up its energy to the piston.



COMPRESSOR WITH CONTROL TO ECONOMIZE POWER
By varying the clearance to suit the demand for air the power input is reduced considerably at partial or no-load.



CROSS-SECTION OF COMPRESSOR SHOWING CONTROL
The intercooler is placed below the air cylinders. Note that the controls on the cylinders are similar.

During this process the inlet valves remain closed until the pressure within the cylinder falls to that of the intake. When this point is reached the valves open, and free air is drawn into the cylinder during the remainder of the stroke. Thus the amount of air taken into the machine is lessened without reduction in its pressure. On two-stage machines clearance space is added in proper proportion to both high- and low-pressure cylinders, giving a constant ratio of compression and maintaining conditions conducive to the highest efficiency throughout the entire load range.

Another excellent feature embodied in these machines is the maximum-demand stop, which prevents the compressor from being operated at any greater load than is desired. This stop can be adjusted so that the machine cannot be loaded above a predetermined amount. Under conditions where the load factor is low this reduces the maximum demand and permits a saving to be made in the purchase of electric energy.

With clearance control the reduction in power requirements will be in proportion to the reduction in output capacity. All regulating mechanism is independent of the running gear. Loading and unloading is performed in steps the size of which is small enough to preclude any undue fluctuation in current demand.

Belt-driven compressors of this type can be furnished either single- or double-stage. The piston displacement capacity for a discharge pressure of 100 lb. ranges from 610 to 1,505 cu.ft. of free air per minute. Such machines may also be had arranged either with the ordinary or the short-belt drive with floating idler. This latter arrangement saves both floor space and belting and permits a greater arc of belt contact. Among the improvements are plate valves for both intake and discharge and a five-step clearance control for regulating the output of the compressor. Valves of the plate type as employed on this machine have been perfected after a complete analysis of their design and operation. The most important details are support in perfect alignment throughout the entire operation and without a wearing guide of any kind.

Reducing Wear, Tear and Decay

Will Neither Corrode Nor Wear Away*

By D. C. Ashmead
Kingston, Pa.

RENEWAL of chute linings always is an important item in the expense of operating anthracite breakers. For years nothing but blue annealed sheet iron was used. Because of the effect of the acid water upon this material it was soon eaten away and the life of a sheet was seldom more than three or four months. Experiments have been made from time to time on other types of linings and some of them are now being employed. A number of companies are still using chutes of the old type but are lining them with galvanized sheet iron instead of with blue sheets. This resists the acid action of the water and also permits the coal to slide on an easier slope.

Vitrified clay pipe makes an excellent lining for coal chutes and appears to resist wear indefinitely. Some chutes so fitted have now been in active service for more than three years and show only slight signs of wear. Great care must be taken in installing the lining to see that the ends of the pieces of pipe exactly match, as otherwise they will wear out more rapidly than if set properly. Glass has been tried by some companies but has been found too brittle. Monel metal also has been used in a few places and to a slight extent.

Sheet Iron Being Replaced in Breakers

The Hudson Coal Co. has made many experiments with chute linings, and during the past two years has installed many breaker chutes made of what is known as "Corros iron." The first trial of these chutes started about two years ago with a half dozen experimental sections installed in the Loree breaker. Since then sheet-iron chutes have been replaced to a limited extent in two other breakers. The Marvine breaker, built during the past year, has been fitted almost entirely with Corros iron chutes.

A typical straight section of one of these chutes is shown in Fig. 1 as well as a typical curved, or spiral, section. It will be noted that in design and appearance these chutes closely resemble those made of cast iron, and, broadly speaking, this is what they really are, as they differ from the ordinary cast-iron chute only in the composition of the metal from which they are made. This material, known by the trade name of "Corros iron," is in reality a high-silicon cast iron, containing approximately 12 per cent of silicon. The properties claimed for it are immunity from corrosion by acid water, comparative freedom from oxidation and extreme resistance to abrasion, as the hardness of the metal is fully equal to that of chilled iron. It is so hard that it cannot be surfaced by ordinary machine tools.

Experience with these chutes would tend to corroborate these claims. Those installed at Loree breaker approximately two years ago show no appreciable wear or deterioration apart from the fact that the inner surfaces have become smoothed and brightened by the passage of material. Installations made more recently have given similar results. It should be noted that when these chutes are first installed they, of course, have a rough cast finish on the inside, as no practicable method has been devised for making them any smoother at this point than can be accomplished by extreme care in facing the mold in which they are cast. As a consequence when the chutes are first installed ordinary pitches are not quite sufficient to carry the material over them. After they have been in service several months, however, the inside surface of the chutes becomes smooth and bright, and the pitch required is only that ordinarily employed for sheet steel under good conditions. When installing these chutes it probably is best to place them on such a pitch as is ordinarily required for the operation of smooth-iron or sheet-steel chutes, and line them with iron sheets. Then this lining should be removed, one sheet at a time from the bottom upward, thus exposing, successively, say each day, a new section of Corros iron to the wear of the material passing down the chute.

The cost of Corros-iron chutes depends largely on the

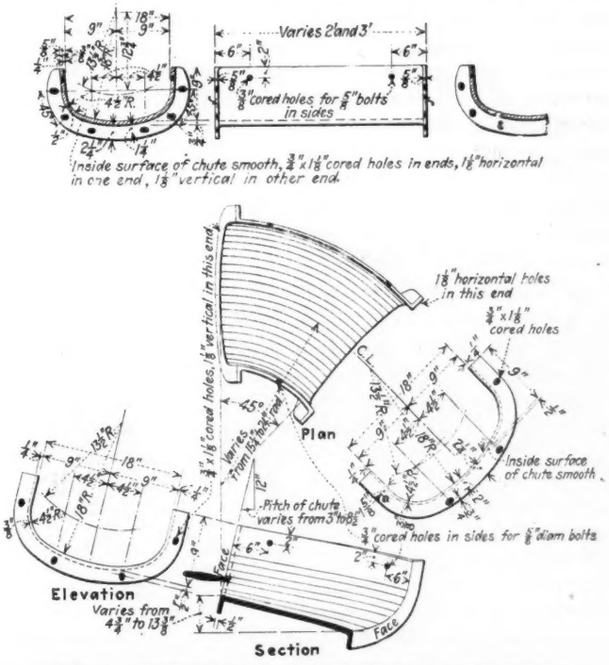

Varies 2 and 3'
6"
5/8" cored holes for 5/8" bolts in sides
Inside surface of chute smooth, 3/4" x 1 1/8" cored holes in ends, 1 1/8" horizontal in one end, 1 1/8" vertical in other end.
1 1/8" horizontal holes in this end
3/4" x 1 1/8" cored holes
Plan
Inside surface of chute smooth
Pitch of chute varies from 3 holes
3/4" cored holes in sides for 5/8" diam bolts
Elevation
Varies from 4 3/4" to 13 3/8"
Face
Section

FIG. 1. SECTIONS OF CORROS-METAL CHUTING

This illustration shows not only the straight but the spiral chute sections. The metal contains about 12 per cent silicon.

*Excerpt from article entitled "Advances in the Preparation of Anthracite," read before the American Institute of Mining and Metallurgical Engineers at the September session, held at Wilkes-Barre, Pa.

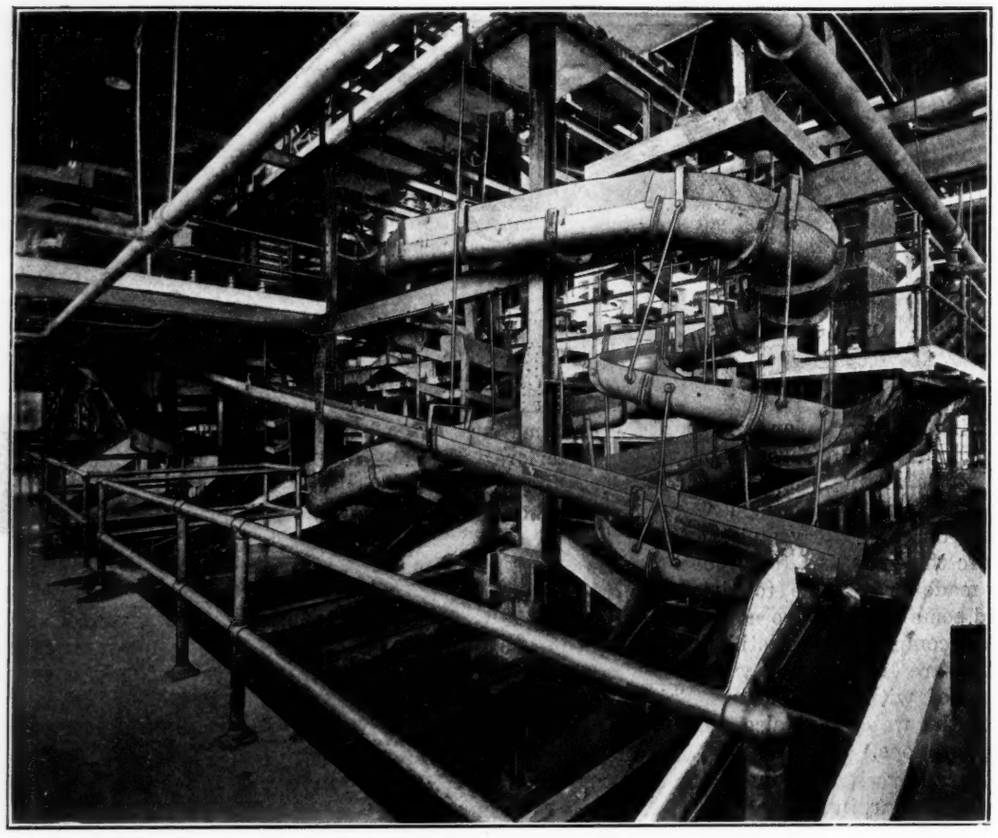


FIG. 2.
Chutes in Loree Breaker
A plant of the Hudson Coal Co. The advantage of these chutes is that they do not obstruct the light or take up much room. It is useless to provide windows in a breaker if chutes are to be erected within it which prevent light from passing through the building after it has penetrated the outer walls. It is largely these neat suspended chutes that make the Loree and Marvine breakers such bright and efficient places for operation. Almost every point in the Marvine breaker is illuminated by sunlight from all four quarters.

nature of the casting, as the chief expense incurred is that of handling the metal in the foundry. Straight sections of 18-in. chutes, 3 ft. long, cost approximately $24 per linear foot. The ordinary breaker chute lined with sheet steel costs approximately $3 per foot. Just how long Corros-iron chutes will last has not been determined, but none has as yet shown appreciable signs of wear. It has been demonstrated that in certain locations Corros iron has already outlasted at least ten renewals of No. 10 sheet-steel chute lining, and bids fair to last indefinitely. The erection of Corros-iron chutes requires care, as they are necessarily made in flanged sections of definite size; moreover, this metal is rather brittle, being only about half as strong as ordinary cast iron, so that adequate supports must be provided.

Fiber Pipe Does Not Corrode in Acid Water And Is Unaffected by Electrolysis

A PIPE has been made of fiber on which sulphuric, hydrochloric, acetic and other acids have no effect and which chlorine gas will not injure. The Massachusetts Institute of Technology has shown that 43,000 volts are required to puncture $\frac{1}{8}$ of an inch of it. All of which might be entirely without interest if the pipe did not have other physical qualities fitting it for the workaday world. As for weight, however, it is one-quarter that of iron or steel pipe; as for strength it has stood 4,124 lb. per square inch of cross-sectional area applied externally and 782 lb. applied internally. It is recommended by the manufacturers for use under a pressure not exceeding 600 lb. per square inch, as they assert that it is capable of withstanding much greater pressures under actual working conditions.

The Massachusetts Institute of Technology has shown that it expands only twenty-six ten-millionths of an inch per degree Fahrenheit. Sudden changes of temperature do not affect it, but it is not recommended for use in conveying steam or hot water at over 180 deg. F. Being light, 25,000 ft. or more of 3-in. pipe can be carried in a single carload. Two-inch pipe weighs $1\frac{1}{2}$ lb. per ft., $2\frac{1}{2}$-in. pipe, 2 lb.; 3-in. pipe 2.5 lb.; 4-in. pipe 4.5 lb., and 6-in. 7 lb. The threads are well formed and can be made with hand-threading machines furnished by the manufacturer. Even 6-in. pipe can be threaded by hand. The pipe has been used by several Illinois coal companies for carrying the most acidulous of water and by Bell and Zoller for casing a hole carrying a cable from the surface into their mines.

Its strength, unlike that of wood pipe, is not dependent on iron bands but is inherent in the pipe itself. A little paint scratched off wood-stave pipe and the bands will corrode, leaving it no longer watertight. The joints of this pipe are, moreover, screwed and therefore reliable.

It is at present made in only 7-ft. lengths or shorter and it cannot be provided with fittings of like material. Lead-lined iron ells and tees are furnished to go with the pipe, also combination couplings for connecting it with iron pipe and pumps. The fiber pipe can be leaded into cast-iron fittings. The cost is unexpectedly low and it can be installed for half as much as metal pipe, because it is light and easy to handle. A coating of a specially-prepared paint makes the joints airtight. No tools are needed to lay it.

It is manufactured by the Fiber Pipe Co., 421 Board of Trade Building, Indianapolis, Ind., under the name of the Bermico Fiber Pipe. It seems likely to solve completely the water troubles in straight-line pipe under and above ground and to serve most acceptably in many other ways around the mine.

Telescopic Props Can Be Used and Re-Used*

SCHWARZ telescopic props have been satisfactorily used in the No. 3 Prosper colliery in Germany since March, 1919, and their use has recently been extended to the timbering of roads. The prop itself has been improved from its earlier form by replacing the upper T-shaped portion, which the original design embodied, by a square channel section which fits into the lower portion, which is a channel of large dimensions (Figs. 1-3). This modification enables the prop to offer greatly increased resistance to bending and buckling stresses.

The wedge lock (Fig. 3) also has been simplified, and now consists of a strong flat bow instead of the former closed strap of malleable cast iron, the bow being secured by a square-headed wrought-iron bolt with collar and cotter. The props used in the roads, especially those for the face conveyors, are substantially of the same type but of larger section, and the two adjustable wedge locks are flat bows riveted on the lower member of the prop instead of being fitted with eccentric bolts. The wedge surface of the upper member is 18 in. long, and the two fixed bows are arranged at such a distance apart that when the upper member has sunk to the level of the lower edge of the bottom bow—at which moment the wooden wedge should be driven into the latter—the tapered surface of the upper member has just passed the upper bow. (See Figs. 4 and 5). This type of the prop has a flat, unexpanded and unrounded base.

The props are constructed to telescope so that in a road 7 ft. high the roof may sink 28 in. before the height is such that the prop is too long to use and the roof must be ripped if the post is to be retained in place, but by that time, in most cases, the pressure has been taken up by the packwalls. The place is then retimbered with pointed-wooden props and thick bottom pieces, the iron props now recovered being used again near the face.

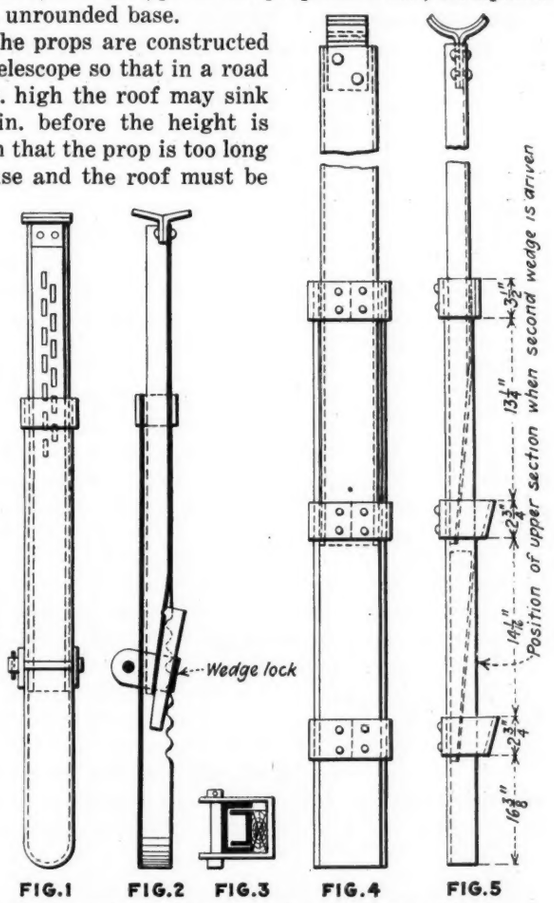


FIG.1 FIG.2 FIG.3 FIG.4 FIG.5

PROPS THAT HOLD SLATE AS ROOF LOWERS

The upper part of the post wedges its way down into the lower half as the roof descends. In Figs. 4 and 5 a prop with two wedges is shown.

*From *Glückauf.*

Cable Exterior Being of Rubber, Not Braid, Greatly Extends Life of Conductor

THE upkeep of the many cables to cutting machines and cable-reel locomotives is a considerable and continuing expense. Like all decay wear and tear, the expense of replacement is not the only cost. A cable the insulation of which has been injured wastes current, makes the handling of the cable dangerous and might even cause a mine fire. Where the splicing is inadequate the voltage is lowered, the cutting or hauling abilities of the machine are impaired and there is a risk of burning the armature by excessive use of current.

Single- or multiple-conductor cables with an exterior covering of rubber in place of the ordinary braid are by no means new. Recognizing the remarkable wear-resisting qualities of the rubber used in the manufacture of ordinary pneumatic tires, builders of electrical cables have long sought to obtain this quality in the covering for such conductors. It can hardly be conceived that a tire subjected to the road abrasion and the stresses it receives would long endure if its exterior wearing surface were composed of cotton fabric or braid. In tire building, as is well known, cord or fabric is used as reinforcement only, the rubber on the tire exterior receiving the actual wear.

In developing Super-Service cable the Rome Wire Co., of Rome, N. Y., followed the same general procedure as that pursued by tire builders. Instead of using a braid covering, a loose hard braid is embedded in the rubber coating of the conductors and, like automobile tires, the cable is vulcanized in molds under great pressure, making the insulation extremely dense and thus impervious to oils, grease, gasoline and alkalies and resistant to the ill effects of high temperatures. The rubber employed is of the same quality as that used in tires guaranteed for 6,000 miles or more.

A piece of this cable was placed across a factory driveway and allowed to remain there for forty-five days. During this time it was crossed by all vehicles entering the yard. These were of almost endless variety. Five-ton trucks, ordinary pleasure automobiles, horses and wagons, wheelbarrows, bicycles and the feet of pedestrians all tended to pound and grind this cable into the pavement. At the conclusion of the test, however, the cable appeared to be entirely uninjured except that it was somewhat dusty. When pounded under a trip hammer the cable was not permanently flattened nor was the rubber broken.

Placed under the tension of 200 lb. a piece of No. 16 two-conductor cord 6 in. long stretches about ☆ in. This size of cord will take a pull of 350 lb. without breaking. Not only have tests like these conducted at the manufacturers' plant indicated extreme tenacity of the product but cords and cables in use for many months throughout various parts of the country have demonstrated their long life and excellent wear-resisting qualities.

Does Not Corrode or Become Air-Bound

IN HANDLING mine water, particularly if it be corrosive, the most serious problem presented is that of obtaining satisfactory pumping units for gathering from the workings to the central sump, where a high-pressure pump can void the water to the surface. Such gathering pumps must be compact, as they have to be located where space is an important consideration. They must be rugged and simple in construction and, above all else, they must be reliable.

In theory the centrifugal pump would be ideal for this work were it not for one operating condition. Gathering pumps are placed above the liquid level and although the suction lift is small, the flow of water is variable. Thus, even if such a machine be fitted with a foot valve there is always danger not only of valve trouble but that in addition the foot of the suction pipe may be actually uncovered. In this case air would be admitted to the pump and the "prime" would be lost. This would necessitate shutting down the unit.

The absence of satisfactory means for preventing these troubles has resulted in the almost universal adoption of direct-acting pumps for gathering service.

These will lift water from a level lower than their own and are not seriously affected by admission of air to the suction. They often have, however, only relatively short life because of the structural necessity of using materials insufficiently resistant to corrosion.

A type of centrifugal pump is now being marketed that combines extreme simplicity in construction with an ability to retain prime, even though air be drawn into the suction. This pump originally was developed for the handling of highly corrosive liquids in chemical plants but the design readily lent itself to the employment of a variety of corrosion-resisting materials.

The design of the pump is so unusual that a brief description will be of interest. Fig. 1 shows a motor-driven pump with priming connections removed and with suction head unbolted so as to show the pump interior. It immediately will be noted that the pump does not have the usual discharge chamber, or volute. The impeller has a multiplicity of short blades which extend practically to the casing wall. These blades are supported on the shaft by a spider. It should be noted here that the central or spider portion of the impeller does no pumping and indeed is not shaped to fit the casing.

The shape of the casing prevents impact of the incoming liquid against the impeller, and as all work is done at an angle of 90 deg. to the shaft, no end thrust is produced. This permits the elimination of thrust or other bearings except those on the driving unit. The impeller is provided with sufficient shaft to pass through the stuffing box and extend outside of the pump casing. It is then attached directly to the shaft of the driving machine, either motor or turbine.

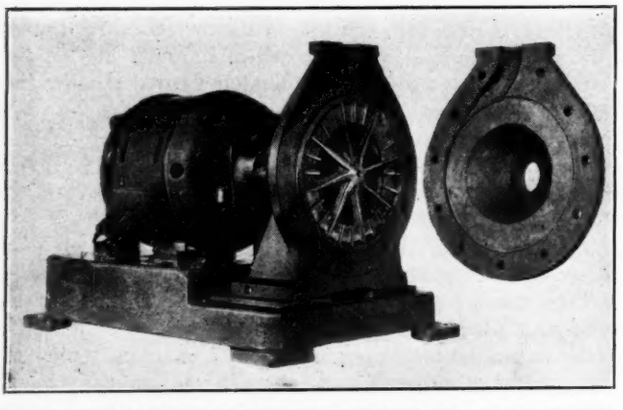


FIG. 1. MOTOR-DRIVEN PUMP, SUCTION HEAD UNBOLTED
Pump has also its priming parts disconnected. It will be seen that the impeller has a multitude of short blades which extend almost to the casing wall but only a short way toward the center of the spider.

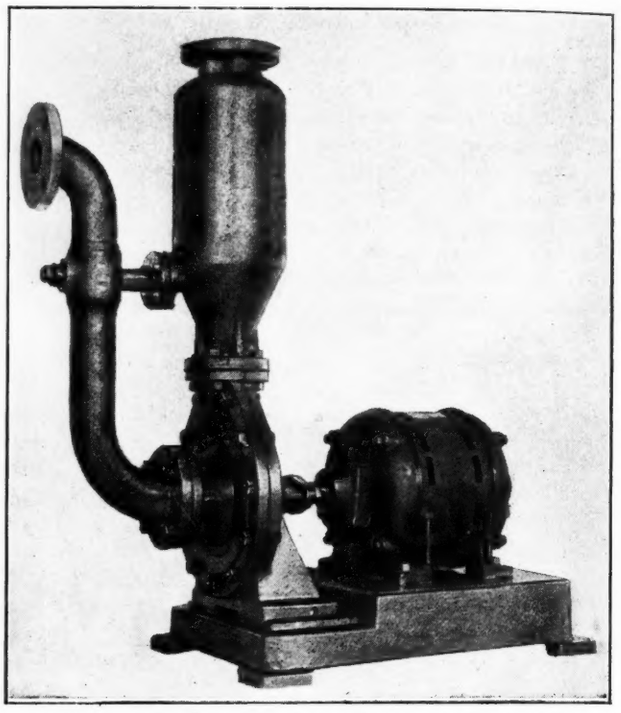


FIG. 2. PUMP WITH ITS PRIMING CONNECTIONS
The entrained air is removed from the water in the large chamber above the pump, a small bypass returning a portion of this water to the mixing connection on the suction pipe.

The actual working area of the impeller blades is so slight that only a small amount of liquid is needed to seal effectively the interstices, even though the clearance be as great as 3/32 in. This from a practical standpoint means that as long as sufficient sealing liquid is provided the pump will continue to function.

Fig. 2 shows a pump assembled with its priming connections. On the discharge is provided a chamber which serves to assist in the separation of entrained air from the liquid. A small bypass returns a portion of this liquid to the mixing connection on the suction side of the pump. Here the sealing liquid is mixed in a fairly uniform manner with the air in the suction line and the mixture then passes into the machine. Some idea of the effectiveness of this unit may be gained from the fact that with an empty suction line sealed at the intake end, vacuums in excess of 20 in. may be readily obtained. This is accomplished by the pump itself and not by means of ejectors or similar appliances. Recirculation of the priming liquid reduces the normal pump capacity by only about 10 per cent.

This pump, which is the product of the La Bour Co., of Michigan City, Ind., is extremely compact and may be mounted on a truck or on skids as well as permanently. No foot valve is needed and no float or other automatic control is required. If at any time during operation the supply of water should be cut off, even for several hours, no harm will result and the machine will resume operation when water again seals the suction opening. In other words, it is impossible to air bind this pump.

How Journal-Box Mine-Car Truck Retains Its Alignment, Thus Reducing Track Accidents

Car Wheel Revolving on an Axle When Rounding Curves Receives Side Thrust and Wears Excessively, Soon Becoming Dangerous —Much of This Can Be Obviated by Attaching Wheel to Axle

By F. C. Barks*
St. Louis, Mo.

THE cost of transporting coal underground from the face to the shaft or other opening is an item of mining expense that depends largely upon the mine-car trucks employed. This item becomes large if truck failures are frequent, for in addition to the cost of repairing breakdown there may be the added expense of wrecks and the consequent loss of production.

Minimum transportation cost is attained only when trucks are built sufficiently durable to render long and continuous service under all conditions. The above being true, the building of a mine-car truck is a matter to which serious thought and study may well be devoted, for to produce a truck that is durable and will give service under the most severe conditions requires both careful design and the employment of suitable materials.

Even good axles, wheels and bearings will not produce a good truck if incorporated in a poor design. Accordingly the matter of design may be called a consideration of first importance. Generally speaking there are only two types of trucks from which to choose, these are (1) those in which the wheel turns on the axle, and (2) those wherein the wheel does not revolve upon, but with the axle, which in turn rotates within a journal box.

These two classes can be subdivided, the first to include plain-bore, self-oiling and roller-bearing wheels, and the latter to include both the rigid and the self-aligning journal box. So far as the basic principle is concerned, however, there are only the two general types.

In every truck made, regardless of the type, one constant relation between the wheel and the axle exists—all loads and side stresses received by the wheel are carried to the axle. (See Figs. 1 and 2.)

When Flange Pressures Set Up Wear in Axles

Whenever the wheel flange comes in contact with the rail, as is the case either in rounding curves or on uneven track, pressure upon the flange develops and is transmitted directly to the axle at the end of the wheel hub, as indicated by the arrow "A." Another pressure, "B," is set up also on the outer end of the wheel hub.

If no movement takes place between the wheel and the axles—that is, if the wheel and the axle revolve together —this force is merely a static pressure of metal against metal, and cannot produce wear. However, if the wheel revolves on the axle, motion is combined with pressure, and wear results. There can be no wear of either a wheel or axle where there is no motion between the two, but the instant that motion is introduced wear begins.

It is highly desirable in a mine-car truck that the wheel shall fit the axle closely, so that there be no chance for the wheel to wobble. If this be desirable in a new truck it is equally so in one that has had several years of service. The surest way to maintain a close fit between these members is to design the truck so that the wheel does not turn on but with the axle.

The effect of pressure when combined with motion, as well illustrated in Fig. 1, has proven disastrous, having been the cause of much truck trouble and expense. This destructive factor applies to every truck wherein the wheel turns on the axle, regardless of whether it be fitted with plain or with roller bearings. In the one there is sliding friction and the other rolling friction between the wheel hub and the axle.

Sliding friction is perhaps the more destructive, as it is more difficult to lubricate, but rolling friction, particularly where excessive pressure is involved, is

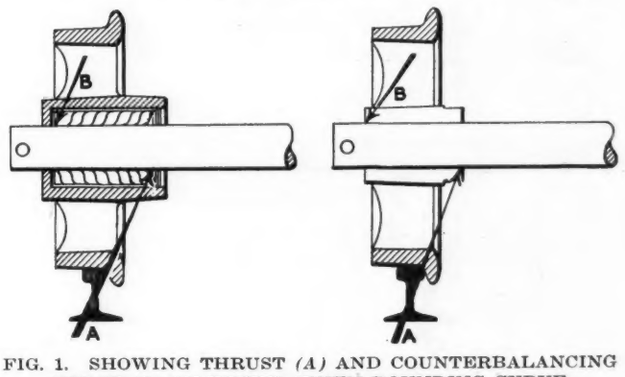


FIG. 1. SHOWING THRUST *(A)* AND COUNTERBALANCING FORCE *(B)* ON WHEEL WHEN ROUNDING CURVE

This is the condition when the wheel is loose on the axle. The thrust and counter-thrust result in uneven wear either on the roller bearing, as in the left, or on the plain bearing, as on the right.

*President, Lincoln Steel and Forge Co.

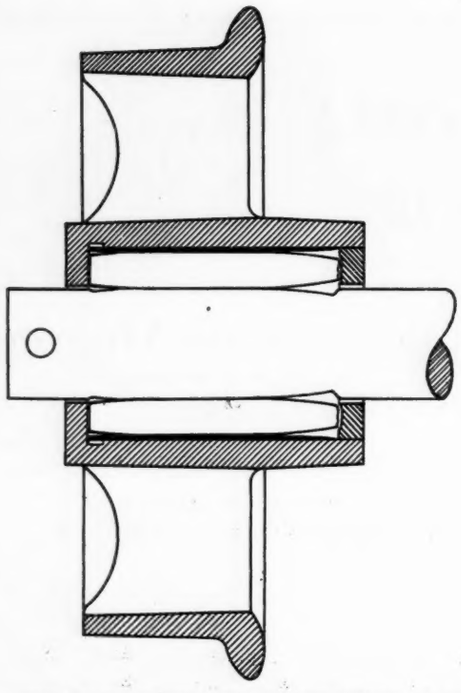


FIG. 2. ULTIMATE CONDITION OF BEARING AS RESULT OF THRUST

Hub ends wear large and out of round, rollers wear cigar-shape and axles are scored where plain-bored and self-oiling wheels are used.

concentrated at the points of roller contact, and the tendency is to wear a groove in the axle, point the rollers, or wear the inner surface of the wheel hub or the roller-bearing bushing, or all of these combined.

Every manufacturer knows that these conditions exist and has partly succeeded in overcoming the wear by extending the rear end of the hub, thus reducing the pressure. The hardening of the axles and rollers by heat treatment also helps materially, as the harder these members are made (up to a certain point) the longer will they resist wear.

Correcting the fault in this way is only a temporary expedient, however, as the forces that cause the wear depend upon the load carried and the speed. A truck of this type might give good results when carrying a four-ton load at twelve miles per hour, but might quickly fail if the speed were increased to sixteen miles per hour.

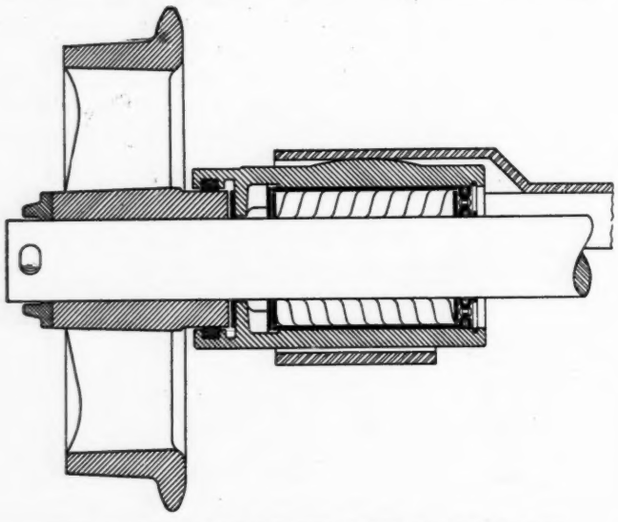


FIG. 3. MINE-CAR WHEEL WITH JOURNAL BOX

A wedge is placed directly over the journal, which wedge is crowned on top so as to distribute the weight and make the axle wear even.

Many examples of failures from the above causes are to be found in the scrap piles. Plain-bore and self-oiling wheels wear large and out of round at the hub ends (Fig. 2), while the rollers in wheels employing them wearing away at the extremities, become cigar-shaped; the axles being scored by the movement of the bearings. With any of the above conditions the operator does not get the service that he should get from his equipment, and mining costs are increased.

Cure for Wear Is Use of Journal Boxes

The surest cure for these evils is to remove the cause. This is purely a matter of design, the cause being entirely eliminated in the journal-box type of truck—the one in which the wheel and axle turn together, the latter revolving within a journal box.

Of the two types of journal boxes—the rigid and the self-aligning—the latter is unquestionably to be preferred, as its value has been repeatedly proven by railroad experience. In these boxes the bearing is held in position by a "wedge" placed directly over the journal (Fig. 3). In this position it carries the same weight as the bearing. When first used by the railroads this wedge was flat on top. Now it is crowned —that is, made higher in the center. With the flat wedge the weight could not be equally distributed over the bearing, and the result was that the axle wore unevenly, and "hot boxes" were common.

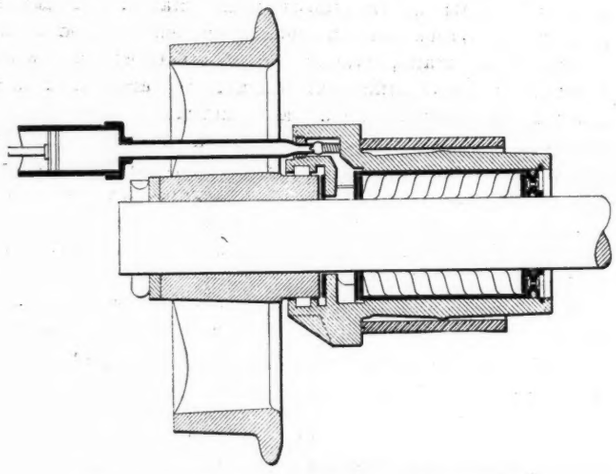


FIG. 4. METHOD OF GREASING CAR WHEEL

A grease gun is inserted between the spokes of the wheel, where a self-closing spring oiler with a beveled face is located. This guides the gun to the right place. The grease passes to a storage and distributing chamber, from which it is slowly delivered, completely coating the roller bearings.

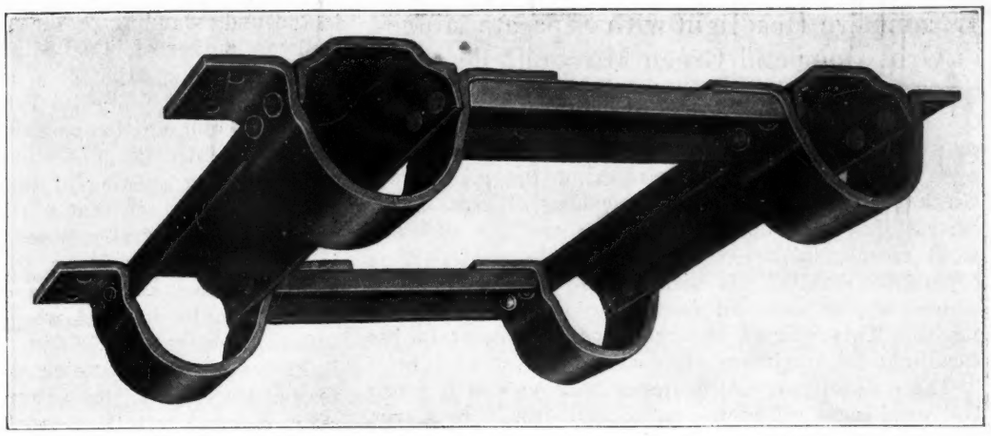
This was corrected by making the wedge higher in the center. As this distributed the weight on the bearing so that it bore on every point of it equally, the axle wear became uniform. This detail was worked out by the railroads at a time when loads were light and speeds low. If any attempts were made now by the common carriers to use flat-topped wedges with present-day heavy loads and high speeds, the results would be disastrous.

In mine-car trucks roller bearings are generally conceded to be more efficient than plain bearings. They hold grease better, give longer service and produce an easier-running car, provided, of course, they are properly placed and cared for.

FIG. 5.

Truck Frame

Rigidity in construction in the frame is of primary importance. A mine-car truck should keep its shape regardless of the many impacts to which it is subjected.



It is of the greatest importance, even when used in a journal box, that these bearings be placed in such a manner that the weight carried will be equally distributed over their entire length. This is easily accomplished by crowning the upper surface of the journal box—that is, making it highest at a point directly over the center of the bearing. The weight of the car, of course, rests on the high point of the journal box, and is therefore naturally distributed evenly along the bearing.

Mere employment of the self-aligning journal box does not by any means insure that the truck upon which it is placed is durable and will stand up under severe service; it signifies only that the manufacturer has started in the right direction.

There are still many adverse conditions to contend with, and the success with which he surmounts these obstacles determines the real value of his truck. In order that a truck may give satisfaction it should last for many years without undue or excessive wear on any of its parts that would render it unsafe to operate.

Other Qualities a Truck Should Have

Some of the more important factors that a manufacturer must incorporate in his truck are as follows: (a) Strength, (b) ease of greasing, (c) a simple and safe wheel fastening, (d) provision for side thrust, (e) provision for quickly replacing any broken or worn parts, (f) provision for maintaining a fixed wheelbase. Yet while he provides all these factors the height of the car must not be raised over that of other types of trucks having the same wheel diameter.

To illustrate how these features can be built into a journal-box truck, reference may be made to certain details of the Lincoln truck, which is of the self-aligning journal-box type. This truck is an individual unit of the mine car—that is, it embodies a complete frame to which the car body is attached, and on which it is carried.

Frame Is Pressed From Heavy Flat Bars

The frame is pressed or forged from heavy flat steel bars and channels, so that it can withstand corrosion for many years and still maintain adequate strength. The pockets on the sides receive the journal boxes, this construction positively maintaining a fixed wheelbase.

The ease with which a truck of this kind can be greased is of great importance because adequate lubrication is absolutely essential to the long life of any journal, and the more easily the lubricant can be applied, the more certain is the box to receive it. Fig. 4 shows that the truck in question can be greased from the side by inserting the gun between the wheel spokes. To facilitate this operation a self-closing spring oiler with a beveled face is provided. This guides the end of the grease gun into the oil hole and consequently the operation of greasing is accomplished quickly.

The interior of the journal box is so designed as to divert part of the grease to the roller bearing and part to the shroud surrounding the wheel hub. It is within the lubricated area of this shroud that the wheel hub, bearing against a steel wearing washer, takes the side thrust. The importance of a shroud for keeping the end of the wheel hub lubricated cannot be overestimated, and many sad experiences have resulted from inattention to this detail.

Enables Grease to Travel to Wheel Hub

The shroud also enables the grease to travel along the axle into the wheel hub, providing the amount of lubricant necessary for the loose wheel when rounding curves or when spragged. Little lubricant is required at this point, yet a certain amount is highly desirable.

As a wheel fastening a cotter pin is generally accepted as being the most efficient, but it should, however, be protected against wear. This can be easily accomplished by using a washer with projecting lugs, thus preventing motion between the washer and cotter.

Grease Trolley Wire to Prevent Sparking

By W. H. Hunt*
Central City, Ky.

By GREASING the trolley wire with a hard conducting oil of a cheap grade the trolley wheel may be caused to operate without sparks or flashing yet without involving any considerable expenditure. Sparking and flashing at the trolley are annoying and injurious to the motorman. The singing of the trolley wheel cannot be heard when grease is used.

The practice also saves the wear on the trolley wheel. It is said that one new wheel on greased wire will outlast a dozen on dry wire. Furthermore it gives perfect contact and so saves power, especially on a heavy grade. One greasing will serve under ordinary use for five or six months. A number of mine officials in my district are greasing their trolleys, and they are so well satisfied with the results that they will never again use a dry wire.†

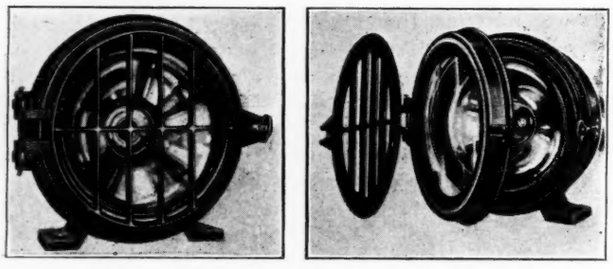
*Assistant State Mine Inspector, Second District, Kentucky.

†The practice is followed also on street railroads for the purpose of preventing sleet from accumulating on the trolley wire.—Editor.

Locomotive Headlight with Separate Hinged Grid Door and Green Mirror Reflector

FOR avoidance of accident a headlight should be clear and bright yet not dazzling. Formerly mine-locomotive headlights were built with the glass fitted into a grid door. This, while protecting the glass from breakage, rendered its proper cleaning difficult if not impossible of accomplishment. In a new type of headlight recently placed on the market the grid door is separated from the one carrying the glass, both being hinged at the side and fastened by the same locking device. This enables the motorman to maintain his headlights at maximum efficiency.

These headlights are equipped with yellowish green mirrored glass reflectors molded and ground to a true parabola and then polished and silvered. In the process



LOCOMOTIVE HEADLIGHT THAT LIGHTS WITHOUT DAZZLING PASSERBY

On the right is the headlight with grid and glass front, which are separately hinged so that the latter may be cleaned. On the left is the light as it appears when approaching the observer. The reflector and socket are flexibly suspended to prevent jar of the lamp filament.

of reflection many of the violet and blue rays are absorbed and a beam of golden yellow non-dazzling light capable of penetrating fog or dust much more deeply than white light, is projected.

Glass reflectors such as these are not only highly efficient but are also durable, permanent, non-tarnishable, are easily cleaned and never require polishing. Reflector and lamp socket are flexibly mounted in the case so as to prevent the vibration of the locomotive from breaking the lamp filament. The case is made of cast iron and provided with a rear door, permitting adjustment of the socket so as to bring the filament to the focus of the reflector. All parts may be removed through the front door, making inspection and repair easy. This lamp was designed especially for use on mine locomotives and is placed on the market by the Electric Service Supplies Co., of Philadelphia, Pa.

Mine-Rescue Work and Organization as Practiced in Great Britain

THROUGH the National Safety Council, through first-aid and mine-rescue meets, international and local, as well as through the U. S. Bureau of Mines and the technical journals, a fair knowledge of American practice in mine-rescue work and organization has been obtained. Our readers will welcome, however, the opportunity to become acquainted with British methods which is afforded by the new book on "Mine Rescue Work and Organization," published by Crosby Lockwood & Son, of 7 Stationers Hall Court, London, E. C. 4, and obtainable of the D. Van Nostrand Co., 8 Warren St., New York City.

This book of 171 pages, well but not excessively illustrated—the cuts are all well chosen and essential to the understanding of the text—is written by H. F. Bullman, author of "Coal Mining and the Coal Miner," and Frederick P. Mills, chief officer of the Durham and Northumberland Collieries Fire and Rescue Brigade, a foreword being written by Colonel W. C. Bleckett, president of the Institution of Mining Engineers.

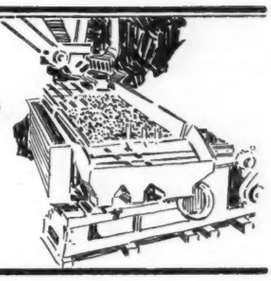
At the very opening of the book is the exceedingly practical suggestion that a bicycle mounted on a stand with the front wheel removed and the back wheel subjected to a braking device, giving a definite retarding effect, be used as a means of testing the ability of rescue men to do hard work without excessive pulse action, rapid breathing and trembling. This machine is known as an ergometer and was invented by Professor Martin, of the Lister Institute. It seems a severer, surer test than can be obtained by requiring the man whose heart is to be tested to run around a room before examination. Only by having men physically reliable can any assurance be felt as to their ability to meet the supreme test in safety work. A graph has been drawn which shows the amount of carbon monoxide in the exhalations after various outputs of energy in foot pounds both when breathing oxygen and when breathing air. The percentage rises at first and falls thereafter.

The book gives a full description of the training course for rescue men and sample daily reports, medical and other certificates as to their experience and capabilities. It details a drill for smoke-helmet men, who have a telephone attachment added to the helmet. An interesting chapter on the bearing which physiological data have on breathing apparatus and mine-rescue work follows. Various types of breathing apparatus are described—the Aerophor, Proto, Tissot, Gibbs, Paul and Briggs. Smoke helmets, the antipoys apparatus, respirators (gas masks, we would term them), the respirator hood, reviving apparatus and accessory material are treated in several pages. Several American devices such as the Mine Safety Appliances Co.'s carbon-monoxide detector and gas mask are briefly described. A headlight rescue lamp and the Geophone also receive attention. A few pages are devoted to the equipment of rescue stations and brigades and others to the rescue-work regulations of the British Government.

Overfusing and Blocking Circuit Breakers Is Apt to Cause Much Loss

WALTER GREENWOOD, safety engineer of the Carnegie Steel Co., at the meeting of the Metals Section of the National Safety Council at Boston said: "Bad results do not always follow the use of fuses of excessive capacity or the blocking of circuit breakers. For this reason operatives who wish overloads to be carried are encouraged to indulge in these bad practices in disregard of instructions. Even when distant control is employed the contact points of the blades of operating controllers can be made to stick. Damage, however, frequently results before other means that may have been provided will break the circuit. If operators could only be made to realize that overfusing or blocking circuit breakers is the same in effect as rendering inoperative a safety valve or an open throttle valve on an engine the practice would not be followed. The damage it can do is limited in extent only by the protection, if any, provided in the branch system and sometimes it extends back to the generators, with consequent opportunity for accidents.

Improving Quality of Output



Horizontal Screens Offer Many Advantages Over Gravity In the Screening of Bituminous Coal

Bar Screens and the Inclined Shaker Rely on Gravity as Modified by Friction—With the Horizontal Screen, Height Is Saved, Picking Is Easier and More Effective and Screening More Complete

By Wesley S. Harris*
Bicknell, Ind.

FIRST attempts at the separation of screenings from mine-run bituminous coal probably were made on bar screens. The bars in this case were placed on an incline and were variously spaced to effect separation of any desired size from the larger coal. This method of screening became quite general, and is still in extensive use. However, bar screens soon were found to make only an approximate separation of the sizes because of the various inherent difficulties in their operation. With bars sufficiently steep to insure sliding of the coal under all conditions, it was found that the material moved across the screen at such a rapid rate that a large percentage of the finer pieces would remain entrained in the mass, to be deposited with the lump.

Gravity Screens Give Uncertain Operation

It also was discovered that a slight amount of rust forming on the screens would interfere with coal movement. This condition would improve as the rust wore off until the material would again be sliding across the bars at too high a rate for even approximate separation. The velocity at which coal passed over the bar screen was affected also by the moisture as well as by the fireclay or other impurities contained. Even the natural fracture of the material was found to have much to do with the rate at which it would travel across the screens. Suitable inspection of the coal or the removal of the impurities by picking when employed in conjunction with the bar-screen system was, of course, not possible except at those mines having a small tonnage.

Perforated Sheets Replace Screen Bars

In an effort to improve the quality of the screened product, resort was made to flat perforated plates mounted on a slope, with the result that when the angle of inclination was low enough to obtain even an approximate separation of sizes, it was found that the coal would clog and refuse to pass freely over the screen. In order to effect movement of material across such plates, agitation of the screen surface was necessary. Herein lay the germ of the inclined shaking screen.

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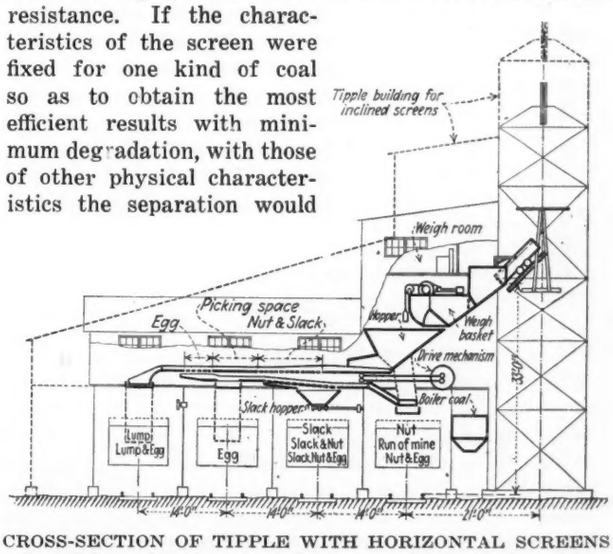
Devices of this type were progressively improved until a series of high-grade balanced screens was developed giving preparation of varying sizes and with facilities for mixing practically any of the grades desired.

In developing inclined screens, engineers found that there was no practical method of determining the proper inclination of the screening surfaces, stroke of the screens and speed at which they should be oscillated. In each case these had to be determined by trial or judged from experience, and when once established for any given installation they were quantities which did not change from day to day.

If Coal Is Not Uniform Screen Works Badly

With inclined as with bar screens the resistance across the surfaces was again found to be variable, depending upon weather conditions, whether dry or wet coal was being handled, the amount of fireclay present and the nature of the fracture. Coal which would flow slowly over the inclined shaker would screen more thoroughly than that which had a lower frictional resistance. If the characteristics of the screen were fixed for one kind of coal so as to obtain the most efficient results with minimum degradation, with those of other physical characteristics the separation would



CROSS-SECTION OF TIPPLE WITH HORIZONTAL SCREENS

Dotted lines show how much larger must be the tipple and how much higher the head frame when gravity screening is used instead of horizontal screens.

either be less refined or there would be an increased breakage due to unnecessary wear between the coal and screen surfaces.

From a careful consideration of all of the above I believe that it is safe to state as a general rule that where gravity is resorted to either wholly or in part for passing coal over screening plates the quality of the preparation will be variable.

With the general introduction of inclined shaking screens and with further demands for clean coal, picking tables or belts were introduced, permitting of hand removal of the impurities after the material had been sized. A further refinement was added in some of the large mines by the introduction of degradation screens which extracted the breakage from the prepared sizes just prior to their being placed in the car.

The latest development in sizing equipment is the horizontal screen, two makes of which are on the market. These are the Marcus and the Jacobsen screens, which are manufactured by several firms under the above trade names. A general drawing of a Jacobsen screen is shown herewith.

Better Sizing Where Gravity Is Not Used

These screens are mounted in a horizontal position in the tipple and in no wise depend upon gravity for conveying the coal over their surfaces. They are so designed that the horizontal motion of the screen moves the coal at an approximately uniform speed of 45 to 50 ft. per minute. Such speeds, I have found, are satisfactory for the removal of impurities by hand picking while the coal is on the screen.

These screens give perfect sizing, as the force of gravity tending to pull the smaller coal through the perforations always acts at right angles to the screen surface. With inclined screens, on the other hand, the action of gravity is reduced in the ratio of the projected area of the perforations to their actual area. There is no tendency for the coal to avalanche across the perforations because the motion of the screen and coal are both in the same plane, the location of which is not changed, as is the case with the inclined shaker.

Action also is of equal intensity on both forward and backward strokes of the screen while with the inclined separator effective motion is possible only on the major portion of one stroke. Horizontal screens also afford an opportunity for the direct removal of impurities from the coal while they are on the screening surface without necessitating additional picking tables. This is so because the screens are not only horizontal in position but are arranged at a convenient height so that pickers may stand on a level floor and work as easily as if picking from a table. Screens of this kind give a slight agitation to the coal so that impurities are more readily detected by the pickers than is possible on a continuously moving belt or table.

Should it be desired temporarily to stop the movement of a large lump of coal for the purpose of stripping off a piece of impurity this can easily be done on the horizontal screen. The lump it is desired to clean is readily held back until the impurity is broken loose. It is not necessary to lift the lump out of the mass. With the picking belt this cannot be done because of the friction between the lump of coal and the rubber or corrugated iron pans forming the table bottom.

Horizontal screens have a greater capacity for a given area than have inclined screens or those of any other kind. The Marcus and the Jacobsen screens are both of the balanced type and operate without in any way subjecting the tipple to vibration.

Horizontal screens, on account of the low headroom required, in many cases can be installed in existing tipple structures with a minimum of expense. In the accompanying illustration I have indicated in dotted lines the outline of the tipple building required for the installation of inclined shaker screens. The saving in building material made possible by the use of horizontal screens is readily apparent from this drawing.

Horizontal screens may be mounted so low that the distance from the dump to the car is reduced to a minimum. This materially reduces the amount of breakage, especially in the nut and egg sizes. This low tipple height also results in a lower hoisting height, with consequent increased capacity of the hoist and a considerably lessened cost of the tipple structure.

Refuse and degradation conveyors may be installed at slight additional cost, as they consist simply of horizontal sheet-iron troughs fastened rigidly to the screens. They partake naturally of the same motion as the screen to which they are attached. This results in the elimination of much extra gearing, shafting and the electric equipment necessary for driving such devices. Such conveyors entail small maintenance charges, as they embody no moving machinery.

Mounting all machinery and screens on one horizontal floor renders this type of screen highly convenient to repair and also facilitates the inspection of coal as it comes from the mine.

Loree Plant Recovers Seven Tons of Anthracite Slush for One Dollar

THE Dorr plant at the Loree breaker consists of a 26-ft. tank which separates the plus 60-mesh solids from those which are smaller. Separation of finer solids could be effected with a larger tank, but as the finer coal contains more ash no more complete recovery from the waste water is provided. The product goes to three Dorr classifiers and the following results are obtained:

Total solids in slush feed to hydro-separator, 49.8 short tons per hour.

Average size of total solids in feed (cumulative):

Size	Per Cent
Plus 60-mesh	44.50
Plus 100-mesh	57.60
Plus 200-mesh	72.10

Average ash content of total solids in feed, 32.9 per cent.

Total solids recovered by hydro-separator and classifier, 22.71 short tons per hour.

Average size of recovered solids (cumulative):

Size	Per Cent
Plus 60-mesh	89.00
Plus 100-mesh	97.00
Plus 200-mesh	99.50

	Per Cent
Average ash content of solids recovered	24.85
Proportion of total solids recovered by hydro-separator and classifiers	45.60
Proportion of total solids lost by hydro-separator	39.10
Proportion of total solids lost by classifiers	15.30
Proportion of plus 60-mesh solids recovered by plant	91.00
Proportion of plus 100-mesh solids recovered by plant	76.70
Proportion of plus 200-mesh solids recovered by plant	62.90
Proportion of total combustible recovered by plant	51.20
Proportion of water eliminated by plant	98.40

The plant shows a direct operating cost of 5.3c. per ton covering labor, power, supplies and repairs, and a total operating cost of 14.3c. per ton, including 8.8c. per ton to cover interest, insurance, taxes and depreciation at 20 per cent on an investment of $17,500 for building and equipment. This cost covers delivery of finished product to a conveyor either for stocking or for loading on cars for shipment. The additional cost of operation for this conveyor will vary with local conditions.

Air-Dump Cars Carry to Storage Pile Small Coal for Which Old Ben Coal Corporation Has No Market

Coal Is Dumped from 12-Ft. Trestles, 100 Ft. Apart, and Handled In and Out of Storage by Clamshell Buckets—Six Air-Dump Cars Receive and Dump a Thousand Tons of Slack and Boiler-Furnace Coal in a Day

COAL companies which during the car shortage found it profitable to store coal ready to load when cars were more plentiful have found that storage in the bituminous region has its advantages at times of unbalanced demand, when for instance domestic sizes of coal can be sold and slack cannot. With no market for fine sizes it does not pay to run the risk of shipping coal of that description without consignee.

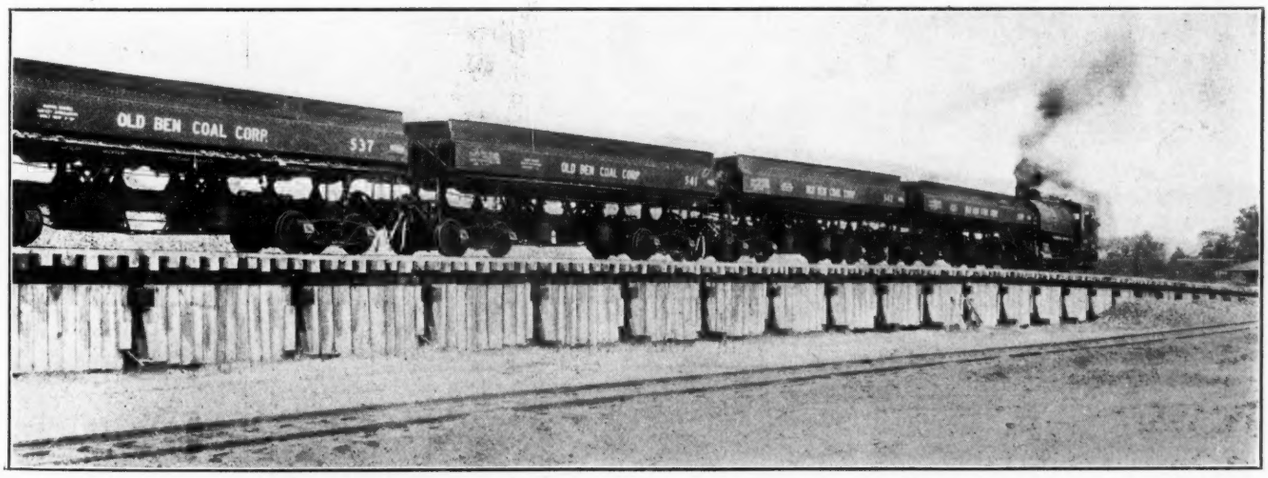
It may be necessary, should that be done, to sell the coal for less than the freight, a practice that demoralizes the market for all the small-sized coal produced. Nor is it profitable, when monthly men have to be paid and a force of daymen and miners has to be kept intact, to wait to fill domestic-coal orders till a demand arises for fine coal. When the market for slack is extremely bad it might be difficult to operate at all if no place or equipment for the storage of coal were available. So there is an advantage in storing in the slackest of times if it can be done cheaply and safely. The anthracite region long ago learned that this is a fact. It rarely has a car shortage, but owing to the unbalanced demand it almost always keeps large quantities of fine coal on hand. This practice is so reasonable that it is sure to grow from now onward.

The Old Ben Coal Corporation owns several mines in Franklin County, Illinois, and during the war, when the car shortage was acute, utilized a number of standard Western 30-yd. air-drum cars at its Buckner operation to supplement the supply of railroad equipment. The dump cars were discharged in a storage yard, and, whenever railroad cars were available, the material was rehandled for shipment.

This expedient proved so successful that the same plan was put into effect recently on a much more elaborate scale at Christopher, Johnston City, Sesser and possibly at other Old Ben operations, in an effort to stabilize production and keep the mines running throughout the working day.

In each installation the storage yard is laid out in such manner as to involve a haul of about one-quarter mile. One high track is placed in the middle of the storage yard. This is built on a strong trestle about 1,320 ft. long and 12 ft. high. On each side of this trestle is a switching track, the distance between centers of the elevated and the switching tracks being 50 ft.

Instead of using the ordinary contractors' dump car the Old Ben company had Western standard steel 30-yd.



STORAGE TRESTLE AT JOHNSTON CITY, ILL., SHOWING TRAIN OF CARS, EACH HOLDING FORTY TONS WHEN FULLY LOADED

This trestle is not really used for storage but for the purpose of placing coal where it can be transferred by a clamshell crane which travels along the track in the foreground of the illustration. The trestle is petticoated with plank so that no coal goes under the roadway. In this way the coal is made readily accessible.

Storage Pile

Almost as fast as the coal is dumped over the sides of the trestle it is moved by a steam shovel to the pile on the left. Note how the trestle is shrouded with plank, so that none of the coal can get beyond the reach of the shovel.

air-dump cars built, provided with steel side-extensions each affording a capacity of 45 cu.yd. and holding about forty tons of coal. These cars are used under the tipples in the same manner as railroad equipment except that the storing is confined to screenings and boiler-furnace sizes. Only six dump cars are required at each mine. It takes about thirty minutes to fill one dump car with furnace coal and two with screenings, the two sizes being loaded simultaneously.

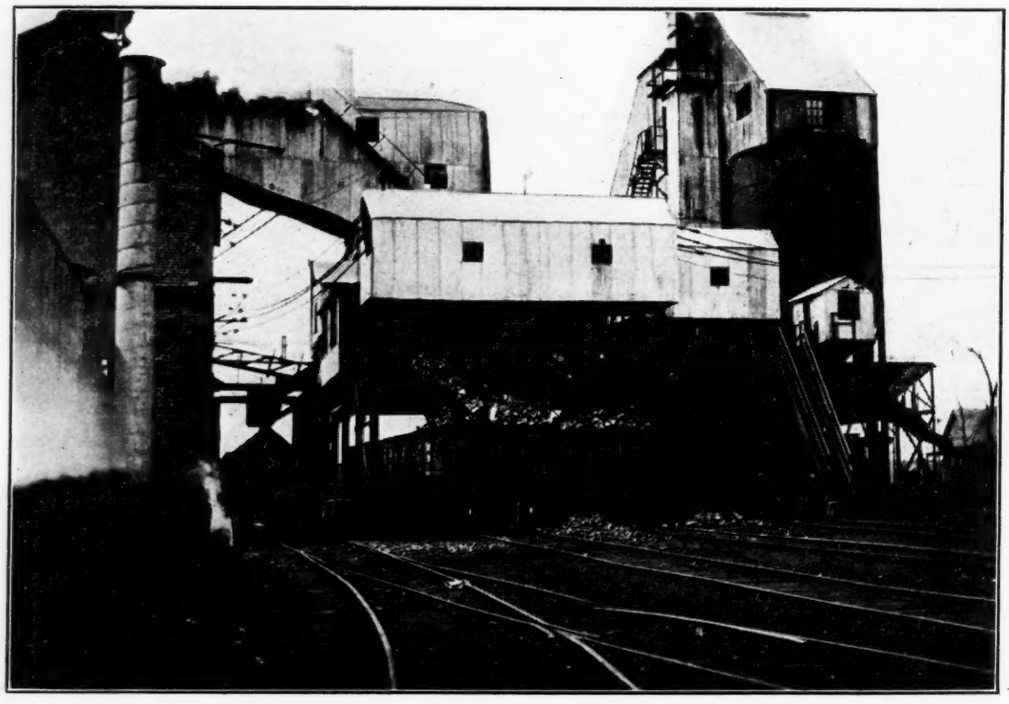
One Locomotive Handles All Dump Cars

It requires from fifteen to twenty minutes to make the round trip to the storage yard with these three cars of coal, including the time taken in dumping. While this is being done three other cars are under the tipple taking on their loads. This enables a single locomotive to handle the dump-car trains, of three cars each, continuously and efficiently. Six air-dump cars thus keep the mine in operation.

The cars are dumped upon both sides of the trestle, and the coal is moved back into storage piles by a clamshell bucket that also reloads it for shipment. The piles thus formed are about 100 ft. apart and the capacity of the storage yard is approximately 70,000 tons. This, of course, could be increased, by further rehandling.

At Old Ben mine No. 16, at Sesser, Ill., 1,084 tons were handled in this way by air-dump cars on Jan. 27 last; 1,013 tons on Jan. 28, 1,039 tons on Jan. 29, 2,000 tons on Jan. 31, and so on. The larger sizes of coal are not included in these figures. They were, of course, loaded into the regular railroad equipment. The cost of storage and reclamation has been about 15c. per ton.

One of the accompanying photographs was taken at Johnston City, Ill., where the Old Ben company recently bought a mine, and is now equipping it for storage and greater production. This picture was made before much coal had been dumped in the storage yard and conveys a good idea of the track-layout and the trestle-construction.



Sesser Tipple

At this tipple, as at those located at Christopher and Johnston City, the sizes of coal for which there is no immediate market are taken in air-dump cars to a trestle 12 ft. high and there deposited, to be stocked and ultimately reclaimed by a steam shovel with a clamshell bucket.

Sale of Small-Size Coal Can Be Promoted By Showing How It May Be Burned

INSTEAD of complaining that the public wants coal that is wrapped in tissue paper and tinfoil it would be better to let the public know that the sizes of degradation have their advantages and that they are not few or unimportant. The message has been carried most successfully to the big producers of power for public or private consumption.

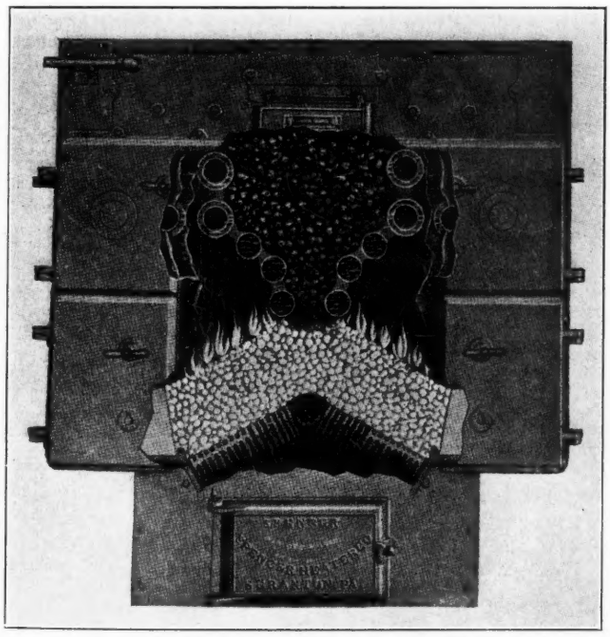
However, these people could be readily appealed to, for they read their technical journals carefully and make a study of their costs. The generality of coal consumers who use coal for domestic purposes make no such effort to become informed. They are their own worst enemies when they go in the market year by year for domestic sizes of anthracite or bituminous, not knowing that with the proper type of furnace the finer sizes can be burned with greater satisfaction than the larger sizes, provided that the quality of the coal by analysis and heat value in each case is the same.

Fortunately the furnace which will burn small coal shows an ability to fit itself to lower-grade fuels such as lignite and so in every way serves to make itself the basis on which to push a successful campaign for the domestic use of fine coal.

Will Be No Need for Coal to Be Large

The advantage of bringing the public to a realization of the value of fine coal is that there will then be no need for any coal to be large. It cannot be made large at will but it can always be made small if the public demands it, and coal can be prepared more readily for the market if the public is not particular as to how small the coal is.

As ordinarily built and handled the domestic house-heating furnace is extravagant in its fuel consumption. Firing a charge of green coal directly upon an existing fire is by no means an economical or scientific method of burning fuel. Such a charge deadens the fire and makes the heat generated irregular—at least for a time. Furthermore, the highly irregular attention that a house furnace ordinarily receives is conducive to neither economy nor efficiency. The ideal house furnace would be one wherein fuel of small, inferior or cheap grade would be fed automatically and in small quantities to the fire when and as needed, and where the intensity or rapidity of combustion would be controlled in accordance with the predetermined temperature desired throughout the house.



A FURNACE THAT WILL BURN SMALL SIZES OF COAL

The furnace feeds itself from a magazine, the coal running down one or both sides of the pile of ash and partly-burned fuel on either side of the grate and so being added to the fire in a thin layer which accordingly is completely consumed. In moderate weathers by letting one side remain ash-bound the capacity of the furnace can be halved with advantage. The quantity of coal burned can be regulated also by varying the amount of ash on the grate.

Many schemes have been tried in the attempt to obtain the results mentioned. Putting the draft under control of a diaphragm responsive to the steam pressure or a thermostat mounted in the living room or elsewhere are familiar examples. In the furnace shown in the accompanying illustration a means is employed for automatically feeding the fuel to the fire in accordance with its requirements.

Essentially this furnace differs from others in that it contains a coal magazine and a sloping grate. The magazine is water-jacketed to keep the coal therein below the temperature of ignition or even that at which, with bituminous coal, coking commences. The grates are placed at approximately the angle of repose of the coal so that an even and uniform thickness of fire will be continuously maintained. This arrangement keeps the fire always bright and clean on top, permitting continuous absorption of radiant heat. Small sizes of this furnace are made with a single sloping grate and side magazine while the larger sizes are built with double sloping grates and a central magazine.

The double grate makes a unit that is highly flexible. In severe weather both grates are used; in mild weather the ashes are allowed to accumulate on one side until they become so thick that fuel from the magazine refuses to flow to that side of the furnace. It is cheaper, more efficient, and requires less fuel to burn one side at normal capacity than to burn both sides of the grate at a greatly reduced capacity.

Can Be Used to Burn Inferior Fuels

Small and what are usually termed inferior grades of fuel may be successfully burned in this furnace. It will operate on anthracite of buckwheat size as efficiently as upon chestnut. In the West it is fired with and successfully burns lignite slack. Of course lump coal cannot be used in this furnace because large pieces will not pass through the discharge opening of the magazine.

The grate bars employed are of the rocking type and the fingers are curved in circular arcs. These fingers are longer near the "peak" of the grate than they are adjacent to the sides of the lining. As a result any clinker that may form will naturally be projected to the lower portion of the grate. Here upon shaking, which is merely a rocking of the bars, they are caught by the short fingers and broken up or reduced in size so that they will pass readily to the ashpit.

The furnace as above described is built in twenty-seven sizes for steam and in fourteen sizes for hot-water heat. It is the product of the Spencer Heater Co., of Scranton, Pa. Not only does it burn coal effectively but for house heating it renders available cheap fuels that heretofore have been considered fit only for steam generation for power purposes.

U. S. Engineer's Office Opens Bids for Coal For Dredges at New York

BIDS were opened Sept. 27 at the U. S. Engineer's Office, New York City, for furnishing 5,000 tons of coal for the sea-going dredges Raritan and Atlantic, the coal to be delivered in lots of 450 tons a week at the following places: Pier 18; Port Liberty and Greenville piers, f.o.b. barge or lighter. The coal was to be classified in Pools 9, 4, 10, 54 or 64, or the equal. Bids were also received for stevedoring. The bids received were:

	Pool No.	Price Per Gross Ton	Stevedoring Per Ton
Astell Coaling & Lightering Co.	.....	.....	$0.998
Standard Coal Sales Co.	.....	$5.29	.91
Standard Coal Sales Co.	.....	6.19 (in bunkers)	
Commercial Coal Co.	.....	6.59	1.10
E. Russell Norton	10	5.66	1.00
Eureka Stevedoring Co.	.....	.....	1.20
Imperial Coal Corp.	.....	5.49	.....
Maryland Coal & Coke Co.	9	6.09	.....
Maryland Coal & Coke Co.	10	5.81	.....
Maryland Coal & Coke Co.	34	5.65	.....
Maryland Coal & Coke Co.	64	5.65	.....
Empire Coal Mining Co.	.....	6.25	.....
Dexter & Carpenter	9	6.34	.....
Dexter & Carpenter	4	6.46	.....
Dexter & Carpenter	10	6.06	.....
Dexter & Carpenter	34–64	5.75	.....
Rapid Coal Co.	.....	.....	.90
National Coal Stevedoring Co.	.....	.....	1.30
Cortright, Dominick & Cunningham, Inc.	9	6.00	1.10
Cortright, Dominick & Cunningham, Inc.	10	5.70	.....
Cortright, Dominick & Cunningham, Inc.	64	5.55	.....
Archibald McNeil Sons Co.	64	5.59	.....
W. A. Marshall & Co.	.....	5.45 for Oct. del.	1.06
	.....	5.75 for Nov. & Dec. del.	
	.....	5.60 for 3 mos. del.	
McCann Camp Co.	.....	5.75	1.35
Vaughn Stevedoring Co.	.....	.....	1.00
Crescent Fuel Co.	64	5.90	.....
Crescent Fuel Co.	10	6.00	.....
Haddock Fuel Corp.	.....	5.34	1.19

Railroads to Ask 28 Per Cent Reduction in Freight Rates on Iron Ore

TRAFFIC executives of railroad lines in official classification territory announced Oct. 6 that in order to move a supply of iron ore prior to the closing of lake navigation, and in order that the furnaces may resume or increase their operations, they would at once make application to the Interstate Commerce Commission for authority to make a reduction of 28 per cent in the rates which were based on the advances of Aug. 26, 1920.

Notice has been given of this purpose to the iron and steel interests through the chairman of their committee and it is expected that this will have an immediate stimulating effect upon the iron and steel production.

The rate, if approved by the commission, will expire with the close of business Dec. 31, 1921, and prior to that date conference will be held with the iron and steel interests to decide upon a policy for the period after Jan. 1, 1922.

Steel Workers Ask Miners to Accept Less; Other Firms, Some Union, File Cuts

LACK of complete harmony between the steel workers' union and the miners' union appeared in the closing days of the hearing in the Trinidad district of Colorado, in which the Colorado Fuel & Iron Co. is seeking to enforce a proposed 30 per cent cut in wages. The steel workers, through a committee supposed to represent them, urged the miners to accept the cut, so that they could resume work in the Pueblo steel mills.

The Pueblo mills are operated by the company and are shut down because of inability to compete with Eastern steel mills. High price of coal is a contributing cause. Many of the mines are operating on a part-time basis at the regular wage scale, pending a decision of the State Industrial Commission, which has been conducting an investigation.

The mine workers' union, through its district president, John McLennan, charges that the steel workers' committee was not authorized to intercede, but represented a hand-picked committee with the company paying their expenses. Through their leader the United Mine Workers' district organization has announced a policy of "no reduction under any consideration."

Since the controversy arose, Sept. 1, two other coal companies operating in El Paso County, have filed notices with the State Industrial Commission of reductions ranging from 10 to 30 per cent, and the Victor-American Fuel Co., the largest operator in Colorado under union contract, has notified the commission that in the event reductions are granted to their competitors they will be compelled to ask similar consideration. Forty miners of the Keystone Mining Co., at Colorado Springs, have filed a protest with the state commission against proposed wage reductions on Oct. 15.

Lehigh Valley Announces Coal-Segregation Plan; Government Objects

THE Lehigh Valley Railroad Co.'s plan for the segregation of its coal properties, in accordance with the U. S. Supreme Court's decision of Dec. 6, 1920, was filed Oct. 6 in the U. S. District Court of the Southern District of New York by E. H. Bowles, vice-president and general counsel of the company. E. E. Loomis, president of the company, in setting forth the plan, said it called for no assessment from the 19,122 stockholders and resulted in no sacrifice of their equity in the coal company investments.

The plan calls for the issuance of $30,000,000 of non-accumulative preferred stock of $100 par value, yielding dividends at 7 per cent, to be turned over to the Lehigh Valley Railroad, the road to convey all of its interest in the common stock to a trustee, who will issue 242,432 certificates of interest in the common stock of the coal company in the ratio of one certificate for every five shares of common or preferred railroad stock. These certificates are to be dividend bearing. The stock of Coxe Brothers & Co. will, until its maturity, Feb. 1, 1926, remain as at present, after which time it is to be sold into the treasury of the Lehigh Valley.

The Government at the same time filed three main objections to the segregation plan.

Idle Freight Cars Reduced 19,838 in Week

A FURTHER reduction of 19,838 in approximately a week in the number of idle freight cars is shown by reports received from the railroads of the country by the Car Service Division of the American Railway Association. The total on Sept. 23 was 414,698 compared with 433,536 on Sept. 15. Of the total, 201,153 were in good order and could be placed in immediate service if transportation demands warranted while 213,545 were in need of repairs.

Tabulations showed 55,849 surplus box cars in good repair compared with 62,372 on Sept. 15, or a reduction of 6,523, while there were also a total of 110,376 surplus coal cars immediately available for transportation purposes, which was 8,138 coal cars less than on the earlier date. A reduction within a week of 1,332 was reported in the number of surplus stock cars.

Kansas Leaders Go to Jail, Having Refused To Give Bond Not to Promote Strikes

ALEXANDER HOWAT, district president of the United Mine Workers of America in Kansas, and August Dorchy, the district vice-president, went to the Cherokee County jail Sept. 30, sentenced to six months each for having called a strike in violation of the criminal section of the Kansas Industrial Court law. They could have escaped serving their sentence if they had consented to furnish bond of $2,000 each that they would call no more strikes in the coal fields of Kansas. Thomas Harvey, secretary-treasurer, is now ranking officer of the district. He is regarded as an opponent of Howat's policies and may be appointed to succeed him.

United Mine Workers to Form Political Party

WHEN the United Mine Workers of America concluded their sessions at Indianapolis on Oct. 5 they had resolved by vote to form a new political party to include organized labor, as represented by the American Federation of Labor, and the organized farmers. Samuel Gompers was requested to call a conference of all the officers of the unions affiliated with his federation to accomplish this end. The vote was almost unanimous and was not prefaced by any discussion.

As a preamble to the resolution a committee report indorsed the Nonpartisan League government of North Dakota, declaring that "to say that labor and the farmer cannot organize politically will not belie the fact that North Dakota has already accomplished this and is the banner state and advance guard of what we hope to be a nation-wide accomplishment."

"We realize that the formation of a labor party proper," added the report, "can be made a reality, but in doing so we should not incur the enmity of those of the already well defined political parties who are our friends. In other words, we must not destroy any structure that now affords a semblance of protection until such time as a new structure can be built."

New Wage Scale to Be Formulated Feb. 14

The conference also resolved to hold its next convention at Indianapolis on the fourth Tuesday in January, 1924. In view of their previously adverse vote requiring the Kansas strikers to go back to work contrary to the wish of Alex. Howat, president of the Kansas district, it was strange indeed that they elected him to represent them as a delegate to the International Mining Congress that meets next year in England. With him they associated William Mitch, secretary of the Indiana district. It seems as if the appointment of Howat was the outcome of a political deal made between the administration and the more lukewarm Howat men at the time when the international officials were striving mightily to have the conference back them in breaking the Kansas strike.

It was decided on Oct. 4 that the demands of the mine workers for a new scale would be formulated not later than next Feb. 14, when the convention will meet again in Indianapolis to receive the scale committee's report.

The conference was informed that Herbert Hoover, Secretary of Commerce, had proposed to John Moore, representative of the mine workers at the Unemployment Conference in Washington, that the mine workers pledge themselves to arbitrate their controversies with the operators next spring.

John L. Lewis, international president, said the union would make no such pledge but would retain the right to strike. He asserted that no one would have the power to agree to arbitration of wage disputes or to make any other agreement concerning the wage scales to be proposed next March until the special convention had been held in February, 1922, to receive the report of the committee on wage scales.

The convention authorized the collection of a special assessment of $3 for each of the membership of approximately 300,000. The International treasury of the organization has about $1,000,000. According to the official financial report, the organization owes sums aggregating $500,000.

In an effort to discredit President John Lewis and his administration Local Union No. 1, of Braidwood, Ill., obtained the indorsement of about three hundred other locals to a resolution divesting the scale committee and international officers of the power to negotiate a wage contract unless it carries the full demands of the membership. The convention voted this resolution down and thus retained to the officers and the committee their power to meet the operators in conference next March.

The convention also upheld the union executive board in fixing the salaries of international officers. This action maintains the salary of President Lewis at $8,000, the salaries of other officers ranging downward according to their position. Provision was made to make the next meeting smaller and less unwieldy by amending to the constitution so as to permit no local union to have more than one delegate unless it has more than 500 members. The convention adopted a number of other resolutions on recommendation of the resolutions committee. These included one asking the American Legion to "set its house in order," but avoiding any criticism of the legion as a whole.

Other resolutions declared for the nationalization of mines, for self-determination for Ireland and Russia, demanding that the election of officers for the American Federation of Labor be by referendum, protesting against the confinement of Tom Mooney and Warren K. Billings in San Francisco, recommending that district organizations use every effort to have laws enacted to protect employees from eviction from company houses, demanding the release of political prisoners, declaring for unemployment and health insurance, pledging moral and financial support to the Mingo strikers, asking that President Harding bring about an investigation of the West Virginia situation, and asking for the enactment of legislation to make unlawful the employment of guards by operators. The convention refused to go on record on the subject of light wines and beer, holding that prohibition is neither an industrial nor an economic question, and therefore had no place in the convention. The delegates refused to concur in a resolution favoring the One Big Union idea.

A ban was placed on miners joining the Ku-Klux Klan. The proposition was voted down that the union expend $500,000 at the discretion of the Kansas district officials in fighting the Industrial Court law. The convention voted for a vigorous prosecution of the attempt to unionize the West Virginia fields and condemned the West Virginia officials for their alleged aid to the operators.

On Oct. 4 the committee specially appointed for that purpose requested President Harding to extend protection to the coal miners held in jail by the West Virginia authorities.

Thirty-Eight Industrial Centers Report More Employees at Work

IMPROVEMENT in the unemployment situation, indications that "the industrial pendulum is definitely on the upward trend," and "marked increased industrial optimism from every section of the country" are announced in the report of the U. S. Employment Service for September.

The report is based on statistics collected from the payrolls of 1,428 firms in sixty-five principal industrial centres, each of which usually employs more than 500 workers. On Sept. 30 these firms had 18,050 more employees on their payrolls than they carried on Aug. 31, an increase of 1.2 per cent.

Thirty-eight cities reported employment increases during September, Toledo, Ohio, leading with an increase of 24.1 per cent, as compared with August. Twenty-six cities reported decreases of employment. The greatest decrease, 5.4 per cent, was reported by Providence, R. I. New York City reported a decrease in employment of 2.2 per cent. The situation in one city—Columbus, Ohio—was unchanged.

"The greatest change reported is in the Western and Southern sections of the country," says the report, "obviously due to agricultural activities and the advance in the price of cotton. The industrial areas in the East not only held their own but slightly increased their forces in many lines, leading with textiles, and including iron and steel and the railroads.

"These favorable trends, however, should not obscure the fact that within the next thirty days thousands of agricultural seasonal workers will return to the industrial centers and join the multitude of unemployed unless buffer employment is furnished until they can be absorbed by their previous occupations.

"The marked increased industrial optimism reported from every section of the country seems to be based largely on the improved conditions in the wholesale and retail business, which has been partly stimulated by the change of season."

Senator Lenroot Attacks Smoot Sales Tax As Almost Impossible to Collect

SENATOR LENROOT, of Wisconsin, attacked the Smoot sales tax on coal in the Senate on Thursday last, arguing that the collection of the tax would be difficult if not impossible of ascertainment and collection. Referring to Senator Smoot's reference to the application of the tax on coal. Senator Lenroot said:

"He says coal sold for consumption in a boiler will be taxable but coal sold for coke will not be taxable, but the coke will bear the tax when sold. Let us see where the Treasury would be in administering this law upon coal. Remember, the manufacturer or producer must pay the tax. Much of the coal is sold by the producer to wholesalers of coal. We have heard something of the American Wholesale Coal Association of late. The wholesaler buys from the producer. He sells to whoever will purchase. The producer does not know, when he makes his sale, whether it will be used for boilers or made into coke. The wholesaler does not know. How then is the tax to be determined and when is it to be paid? Must producers follow their coal to see what becomes of it after they have sold it, or will the government have agents to ascertain what becomes of every ton of coal sold by the producer? It is an absolute impossibility."

Senator Smoot replied that the tax could be administered but said he would explain it later, but Senator McCumber, of North Dakota, said he should explain it while the matter was fresh, and "explain away, if he can, the observations that have just been made with reference to coal."

Senator Smoot said he would give a detailed explanation this week, but in passing said the government would hold the manufacturer responsible for the tax on every sale to a wholesaler, but if the goods were to enter into further process of manufacture the wholesaler would give the manufacturer a certificate and the manufacturer would not be required to pay the tax.

Senator Lenroot also stated that if the tax could be determined and applied it would add from 40c. to 50c. a ton to the price of hard coal, now controlled by a virtual monopoly, and wherever the tax can be shifted at least 40 per cent will be added to the amount which the government receives, to be paid by the consumer. Where the tax cannot be passed on it will add to the already heavy burdens of manufacturers now operating without profit in order to give employment to labor.

Scranton Officials to Enforce Cave Law; Strike Planned in District No. 1

WHEN, on Oct. 3, it was announced to the Labor Committee in Scranton which had been appointed to ascertain the facts, that Alex. Connell, Mayor, and Harold A. Scragg, attorney, of the city of Scranton, intended to require entire compliance with the terms of the Kohler cave law, the mine workers who were out of work because of the closing of the collieries at which they formerly labored determined that a strike was the only solution of the difficulty and to make it large enough meditated on bringing in the whole of the northern coal area, or what is known as District No. 1. They hope that if a general strike of the district is called, in violation though it be of the mining contract, the Glen Alden Coal Co. will be importuned by the other operators to reopen its closed mines and protect itself by placing its operations under the provisions of the Fowler Law.

In refusing to allow violations of the Kohler Law, Mayor Connell said:

"After more than ten years of hard, sturdy, uphill fighting for relief from mine caves the people of this city were successful at the last session of the Legislature in having two laws passed known as the Fowler and Kohler Acts. The provisions of these two laws may appear to the coal operators drastic and a hardship on the coal companies, but really they are not.

"The Fowler Act, creating an anthracite mine-cave commission and providing for a tax on anthracite coal, is the law for which we have been fighting for years, and we know from sorry past experience that the courts would not allow us to tax anthracite coal without also taxing bituminous coal, and to get around this difficulty our lawyers made the acceptance of the tax bill 'voluntary' with the coal companies, and as a little pressure to show them how to accept the Fowler Bill we drafted the Kohler Bill."

Mr. Connell continues with the statement that the act provides for a review of all actions taken by the officials under the Kohler Act and so would not afford them an opportunity "to shake the plum tree," as the mining companies had alleged. The Mayor went on to say that the sentiment toward a loose enforcement of the Kohler Law was not as widespread as the mine workers semed to think and in evidence of that fact he declared that he had recently been accused of slackness in its enforcement by former Congressman John R. Farr.

B. & O. Spends $2,200,000 for New Cars

THE Baltimore & Ohio Railroad Co has awarded contracts for 2,000 new freight cars, of which 1,000 will be box cars and the remaining number steel hopper cars. The purchase will mean an expenditure of $2,200,000, which will be raised by financing arranged some time ago through the National Railway Service Corporation.

The Standard Steel Car Co. has been awarded a contract for 500 box cars and 500 hopper cars, with the understanding that these cars are to be built at the Baltimore plant of the company, located at Curtis Bay.

The American Car & Foundry Co. will build 500 box cars at its plant at Madison, Ill., and the Cambria Steel Co. will turn out the remaining 500 hopper cars at Johnstown, Pa.

President Confers With Lewis to Prevent Interruption of Coal Production

IN AN effort to prevent interruption of coal production after the miners' national agreements have expired next March, President Harding, Secretary of Commerce Hoover and Secretary of Labor Davis held a four-hour conference in the White House, Saturday, Oct. 8, with John L. Lewis, president of the United Mine Workers of America, but no agreement was reached. Mr. Lewis was firm in his stand that the miners could not commit themselves to any prior understanding before they meet next February to consider the new agreements.

Following the conference Mr. Hoover stated that the conference with the miners' representatives was in sequence of discussions carried on during the preceding week with representatives of coal operators under the auspices of the unemployment conference.

"The desire of the conference," he said, "was to determine the steps to be taken now that would minimize the danger of stoppage in coal production at the expiration of the national agreements at the end of March by a prior undertaking to arbitrate any ultimate differences.

"Owing to the situation of the miners' leaders as the result of the decision of the Indianapolis convention to defer discussion of the new agreement until after the February meeting, it has become impossible to come to any immediate agreement."

Freight-Car Loadings Gain 19,543 During Week Ended Sept. 24

LOADING of revenue freight increased 19,543 cars during the week ended Sept. 24, compared with the previous week, according to reports by the Car Service Division of the American Railway Associaton from the railroads of the United States. The total for the week was 873,305 cars, which was the largest number loaded during any similar period since Nov. 20, 1920, but 134,804 cars below the total for the corresponding week last year and 122,596 less than the corresponding week in 1919. Increases compared with the week before were reported in the loading of all commodities in all districts but all were below the corresponding week last year except the Southwestern, which gained.

Senator Kenyon Presents Two Coal Bills—To Regulate The Industry and to Curb Profiteering

SENATOR KENYON, of Iowa, introduced two coal bills in the Senate Saturday, Oct. 8, one intended to regulate the industry itself and the other aimed to curb profiteering. Both measures were referred to the Committee on Manufactures.

The coal regulation bill, which is a modification of the Newton bill, introduced in the House in August, declares the ownership, production and distribution of coal to be charged with publ c interest and use, and directs the Federal Trade Commission to compile reports respecting the ownership, production, distribution, investments, sales, margins, profits, etc., in the coal industries, the information necessary in the compilation of such reports to be obtained from corporations and persons interested in the industry. The commission also is to have the authority to investigate the "organization, business, conduct, practices and management" of such persons or corporations, including any corporation acting as a holding company for or guarantor of the stock of any coal corporation, or any partnership acting in a capacity analogous to that of such a holding company.

The Kenyon bill eliminates section 10 of the Newton bill, which required licensing of operators and dealers. A new provision, however, authorizes the Secretary of Labor to investigate wages for miners and other employees by classes, miners' wages to be shown less operating expenses such as blasting, blacksmithing, etc.

The anti-profiteering bill makes it unlawful for any person, firm, partnership, association or corporation engaged in interstate commerce to profiteer in coal. For the first offense a fine of not less than $100 nor more than $10,000 is provided, while for each succeeding offense the minimum fine is $1,000, while the violator may be sent to prison for from ninety days to five years, in the discretion of the Court.

The measure defines profiteering as charging or exacting excessive or unreasonable prices for coal. It provides that sales yielding margins in excess of the following rates shall be considered evidence of profiteering: sales of operators of not more than 1 000 tons per month, 50c. per ton; sales up to 5,000 tons a month, 50c. per ton on the first 1,000 and 35c. per ton in excess thereof; sales over 5,000 tons, 35c. per ton up to 5,000 tons and 30c. over that amount; sales of less than 12,000 tons a year, 40c. per ton; sales of less than 60,000 tons a year, 40c. per ton up to 12,000 tons and 30c. over that amount; sales over 60,000 tons a year, 25c. per ton.

Senator Kenyon announced that he would urge the earliest possible action on both measures.

Fight for Open Shop Started in Texas Mines

AN OPEN-SHOP fight which bids fair to be a "fight to the finish" is on at Thurber, Texas, between the Texas Pacific Coal & Oil Co. and the coal miners it has employed. The open-shop declaration by the coal mining company came after two unsuccessful attempts to adjust wage controversies between it and the miners so that it would be possible to open some of the mines that have been shut down for several months.

The coal company first announced, after several attempts to compromise with its miners in their wage demands, that it would open Mine No. 10 on Sept. 12 on the wage basis of 1918, which was $5 a day for day labor and $2 a ton for tonnage. The miners had been demanding $7.50 a day for day labor and $2.65 for tonnage. The company's move to open the mine was an open-shop move, according to the miners, and they called on the hoisting engineers to leave their jobs. This the engineers did, and the fight was on.

W. K. Gordon, general manager of the Texas Pacific Coal & Oil Co., has said the company will stand firm in its determination not to pay the wage scale demanded. "We have explained to the men," he said, "that the wages they ask will put the cost of production $1.50 a ton more than the market price of coal, and that under the wages we offer we can expect to sell our coal only at actual cost of production. Two attempts have been made to adjust wages, and both have failed. We have taken the only course open. There are now several hundred idle men in Thurber, all needing employment. If the men will accept our proposition, there will be employment for all."

Boone County Grand Jury Indicts Three Hundred Marchers

ON OCT. 1 the special grand jury of Boone County, West Virginia, completed its work of investigating the recent armed march through Boone County and into Logan County in which hundreds of members of the United Mine Workers participated, and upon the completion if its labors the jury returned a total of 302 indictments, covering treason, pistol toting, stealing and other crimes. Among the 302 indicted was C. F. Keeney, president of District 17, United Mine Workers of America, who is at present in jail at Williamson awaiting trial there on the charge of having been implicated in the death of two men in Mingo last May. The charge against Keeney in Boone County is pistol toting.

The Logan County Grand Jury only a few weeks ago returned indictments against participants in the armed march, and the Kanawha County Grand Jury also is expected to return indictments against those implicated in the march.

Treason against the state is punishable by death. The other offenses carry, on conviction, imprisonment in the penitentiary or jails. Deaths occurred in Logan County, where President Keeney, Secretary Mooney and Blizzard, another official of District 17, are under indictment for murder, but no murder indictments were returned by the Boone County Grand Jury because, so far as can be learned, there were no deaths in that county. More than five hundred witnesses were examined by the grand jury.

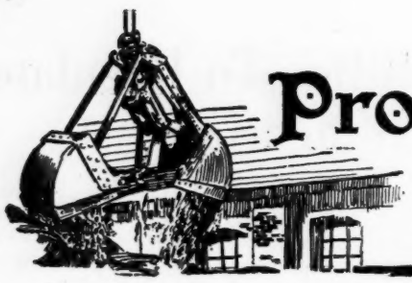
When it became apparent that indictments were to be returned, there was a general exodus of miners from the Boone County coal field in order to escape arrest and trial for participation in the march.

Coal Committee Report Ready for Unemployment Conference; Interested in Wages

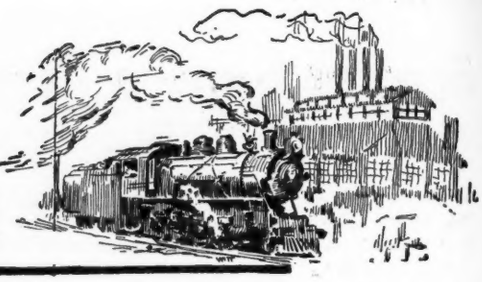
AFTER nearly two weeks of daily sessions the bituminous coal section of the mining committee of the unemployment conference has completed its report. This report deals entirely with emergency relief of existing unemployment among bituminous coal miners. No consideration was given the matter of employment in anthracite mines, as the figures show that more men are employed in that industry than usual and that no emergency exists.

The committee expects to make a more elaborate report on permanent measures intended to prevent unemployment in the bituminous coal mining industry. Thomas T. Brewster, Michael Gallagher and Phil H. Penna, coal operators, have been appointed by the President as advisers to the unemployment conference. The coal committee expected to report to the conference Tuesday, Oct. 11.

Secretary of Commerce Hoover says that the unemploy- conference may take an active interest in the matter of wage awards in the coal fields, which expire March 31, 1922. John L. Lewis, head of the United Mine Workers, a member of the conference, has not been able to attend the conference, having been delayed by his presence at the mine union convention. In the meantime he has been represented by J. Moore.



Production and the Market



Weekly Review

WITH bituminous production gaining its seasonal autumn stride, the majority of the coal operators are sitting by watching the business barometer slowly climb, but some coal men are out tying up large pieces of winter business at low figures—lower than the prices quoted, but how low is not yet known or appreciated. Demand for coal is uneven. New England reports industrial buyers surfeited with bargain coal from West Virginia, Canada dull, Chicago pessimistic, with large buyers in control of prices; Cincinnati with wide price range and buyers hesitant; Cleveland reports better steam demand as iron and steel pick up; Birmingham shows no increase in industrial coal requirements, and the Northwest has sufficient coal to meet all needs even with the more active call as winter closes in.

In the coal fields the non-union mines are busy. Many operators in southeast Kentucky, Logan and both high- and low-volatile along the Norfolk & Western in southern West Virginia are actually setting new production records. The union fields are producing only the highest grades and the business these operations can get is the spill-over from the non-union districts. Pittsburgh, for instance, reports that asking prices on steam are being obtained on sales as demand picks up.

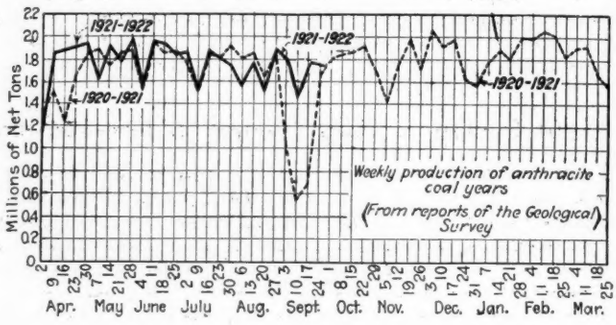
Shipping Board to Aid American Exporters

British competition in the export market may receive a setback by the Shipping Board's offer to lease idle boats to American exporters at $1 per month. The proposal is now being considered by the exporters.

Domestic sizes are the prop holding up soft-coal business everywhere west of Pittsburgh. Save when Pocahontas is being pushed under pressure and at new low figures, as at Chicago and Cincinnati, the trade in household coal is steady and prices are even up. *Coal Age* Index of spot bituminous prices rose to 89 on Oct. 10, from 88 on Oct. 3.

A coal bill for the regulation of the industry itself and another intended to curb profiteering were introduced in the Senate last week. The Coal Regulation bill is not unlike the Newton and Calder measures introduced in the previous Congress although more drastic than either; the Anti-Profiteering bill is one of the most stringent measures for the suppression of coal profiteering ever introduced in Congress.

Cooler weather has quickened the anthracite domestic trading. The family sizes are almost in seasonal call, although orders as a rule are for smaller lots than usual.

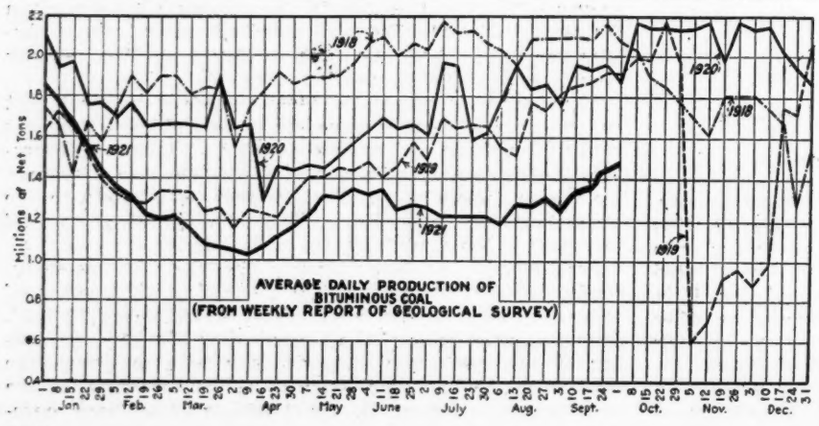

Millions of Net Tons
1921-1922
1920-1921
1921-1922
1920-1921
Weekly production of anthracite coal years
(From reports of the Geological Survey)
Apr. May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar.

The coke market has stiffened, production has increased and prices have strengthened. One heavy furnace inquiry and a better demand have advanced the producers' idea of prices to a level which may be difficult to maintain throughout the balance of the year.

BITUMINOUS

Production of bituminous coal during the week ended Oct. 1 jumped 348,000 tons over the figure for the week preceding and was the largest of any week since last January. The total output was 8,876,000 net tons, according to the Geological Survey. A slight decrease in output is indicated by preliminary reports of the following week—Oct. 3 to 8—when loadings for the first two days dropped 1,127 cars.

The September output was 35,105,000 net tons. The average per working day was 1,386,000 tons over the August


Millions of Net Tons
1918
1920
1921
1919
AVERAGE DAILY PRODUCTION OF BITUMINOUS COAL
(FROM WEEKLY REPORT OF GEOLOGICAL SURVEY)
Jan. Feb. Mar. Apr May June July Aug. Sept. Oct. Nov. Dec.

Estimates of Production

(NET TONS)

BITUMINOUS COAL

Week Ended	1921	1920
Sept. 17	8,187,000	11,654,000
Sept. 24 (b)	8,528,000	11,851,000
Oct. 1 (a)	8,876,000	11,350,000
Daily average	1,479,000	1,892,000
Calendar year	297,346,000	399,936,000
Daily av., calendar year	1,285,000	1,725,000

ANTHRACITE

Sept. 17	1,778,000	718,000
Sept. 24 (b)	1,754,000	1,701,000
Oct. 1 (a)	1,832,000	1,855,000
Calendar year ( )	67,531,000	65,893,000

BEEHIVE COKE

Sept. 24 (b)	70,000	402,000
Oct. 1 (a)	82,000	376,000
Calendar year	4,116,000	16,070,000

a) Subject to revision. (b) Revised from last report.

average. In the eight years preceding, however, the lowest output for September was in 1914, yet even that month showed 39,019 tons. Cumulative production to Oct. 1, 1921, is 296,000,000 tons, or less than during the same period in any of the last nine years.

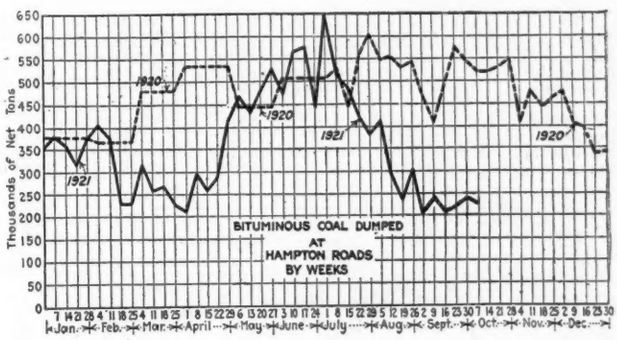
PRODUCTION OF SOFT COAL BY GROUPS OF STATES, 1918–1921
(In Net Tons)

Region	First Eight Months of 1921	Year 1921 at Same Rate as First 8 Mos.	1920	1919
Northeast (*a*)	156,723,000	235,084,000	331,510,000	300,420,275
Southern Appalachian (*b*)	11,037,000	16,556,000	23,500,000	20,803,263
Eastern Interior (*c*)	62,256,000	93,384,000	130,800,000	90,407,132
Western Interior (*d*)	12,805,000	19,208,000	29,930,000	21,741,003
Mountain States and Northwest (*e*)	18,365,000	27,548,000	40,680,000	32,381,012
Total (*f*)	261,186,000	391,780,000	556,420,000	465,752,685

(*a*) Michigan, Pennsylvania, Ohio, West Virginia, Maryland, Eastern Kentucky and Virginia. (*b*) Alabama, Georgia and Tennessee. (*c*) Illinois, Indiana and Western Kentucky. (*d*) Iowa, Kansas, Missouri, Oklahoma, Arkansas and Texas. (*e*) Colorado, New Mexico, Utah, Wyoming, Montana, North Dakota and Washington. (*f*) Alaska, California, Idaho, North Carolina, Oregon and South Dakota not included.

New River and Pocahontas coals are being sold under pressure along Long Island Sound at $6@$6.25, f.a.s. The all-rail movement to New England and eastern New York changed but little during the week ended Oct. 1. According to the Geological Survey, 2,876 cars were forwarded, compared with 2,894 cars the week before and 5,016 during the same week last year.

Accumulations at the Hampton Roads piers are increasing, despite strenuous efforts made to move coal. The bunker trade is absorbing an unchanged volume of tonnage at somewhat lower prices. South American and Mediterranean markets are being exploited as much as possible and constitute the only export trade at present.



Lake dumpings were 724,305 net tons in the week ended Oct. 3—700,297 cargo and 24,008 vessel fuel—as compared with 971,262 tons a year ago. Cumulative tonnage for the season now stands at 19,553,863.

Receipts of coal at Duluth-Superior Harbor declined sharply in September. According to reports from the U. S. Engineer Officer, 207,901 net tons of anthracite and 647,095

Current Quotations—Spot Prices, Bituminous Coal—Net Tons, F. O. B. Mines

Low-Volatile, Eastern	Market Quoted	Sept. 6, 1921	Sept. 27, 1921	Oct. 4, 1921	Oct. 10, 1921†
Pocahontas lump	Columbus	$5.35	$4.90	$4.75	$4.50@$5.00
Pocahontas mine run	Columbus	3.15	2.65	2.80	*2.60@$2.85*
Pocahontas screenings	Columbus	2.30	2.10	2.10	*1.85@ 2.25*
Pocahontas lump	Chicago	5.15	4.75	4.75	4.50@ 5.00
Pocahontas mine run	Chicago	2.50	2.85	2.65	*2.25@ 3.00*
*Smokeless mine run	Boston	5.15	4.90	4.90	*4.75@ 4.90*
Clearfield mine run	Boston	1.95	1.90	1.95	1.70@ 2.15
Cambria mine run	Boston	2.40	2.35	2.35	**2.10@ 2.70**
Somerset mine run	Boston	1.75	1.75	1.80	**1.55@ 2.10**
Pool 1 (Navy Standard)	New York	3.25	3.25	3.25	*3.00@ 3.25*
Pool 1 (Navy Standard)	Philadelphia	2.95	3.10	3.10	2.90@ 3.25
Pool 1 (Navy Standard)	Baltimore	2.50	2.80	2.80	*2.75*
Pool 9 (Super. Low Vol.)	New York	2.45	2.55	2.45	*2.30@ 2.50*
Pool 9 (Super. Low Vol.)	Philadelphia	2.35	2.40	2.40	2.25@ 2.50
Pool 9 (Super. Low Vol.)	Baltimore	2.20	2.60	2.65	*2.35@ 2.50*
Pool 10 (H. Gr. Low Vol.)	New York	2.20	2.30	2.15	2.05@ 2.25
Pool 10 (H. Gr. Low Vol.)	Philadelphia	2.05	2.05	2.05	1.90@ 2.15
Pool 10 (H. Gr. Low Vol.)	Baltimore	2.00	2.30	2.45	*2.25@ 2.35*
Pool 11 (Low Vol.)	New York	2.05	1.90	1.90	*1.65@ 1.90*
Pool 11 (Low Vol.)	Philadelphia	1.80	1.80	1.85	1.75@ 1.90
Pool 11 (Low Vol.)	Baltimore	1.80	2.10	2.20	*2.00@ 2.15*
High-Volatile, Eastern					
Pool 54-64 (Gas and St.)	New York	1.80	1.90	1.90	*1.65@ 1.85*
Pool 54-64 (Gas and St.)	Philadelphia	1.70	1.75	1.75	1.65@ 1.85
Pool 54-64 (Gas and St.)	Baltimore	1.60	1.70	1.90	*1.75@ 1.90*
Pittsburgh sc'd gas	Pittsburgh	2.65	2.65	2.65	2.55@ 2.75
Pittsburgh mine run (St.)	Pittsburgh	2.25	2.20	2.20	2.20@ 2.25
Pittsburgh slack (Gas)	Pittsburgh	1.70	2.15	2.15	2.00@ 2.25
Kanawha lump	Columbus	3.45	3.35	3.25	*3.00@ 3.40*
Kanawha mine run	Columbus	2.15	2.00	2.00	*1.75@ 2.15*
Kanawha screenings	Columbus	1.30	1.25	1.20	1.10@ 1.25
Hocking lump	Columbus	3.20	3.25	3.25	*3.00@ 3.40*
Hocking mine run	Columbus	2.15	2.15	2.00	1.90@ 2.15
Hocking screenings	Columbus	1.30	1.15	1.10	*1.00@ 1.10*
Pitts. No. 8 lump	Cleveland	3.25	3.25	3.25	3.00@ 3.50
Pitts. No. 8 mine run	Cleveland	$2.30	$2.10	$2.05	**$2.15@$2.25**
Pitts. No. 8 screenings	Cleveland	1.65	1.50	1.55	1.50@ 1.60
Midwest					
Franklin, Ill. lump	Chicago	3.65	3.80	3.65	**3.50@ 4.05**
Franklin, Ill. mine run	Chicago	2.95	2.95	2.75	*2.40@ 3.00*
Franklin, Ill. screenings	Chicago	1.85	1.75	1.70	*0.80@ 2.00*
Central, Ill. lump	Chicago	2.70	2.70	2.50	2.00@ 3.00
Central, Ill. mine run	Chicago	2.40	2.40	2.25	1.75@ 2.75
Central, Ill. screenings	Chicago	1.75	1.60	1.45	0.60@ 2.25
Ind. 4th Vein lump	Chicago	2.95	2.95	2.90	**2.35@ 3.50**
Ind. 4th Vein mine run	Chicago	2.55	2.40	2.55	2.30@ 2.75
Ind. 4th Vein screenings	Chicago	1.70	1.60	1.55	*0.90@ 2.15*
Ind. 5th Vein lump	Chicago	2.90	2.90	2.70	2.15@ 3.25
Ind. 5th Vein mine run	Chicago	2.50	2.40	2.50	2.25@ 2.75
Ind. 5th Vein screenings	Chicago	1.75	1.55	1.45	0.70@ 2.15
Standard lump	St. Louis	2.50	3.15	3.25	**3.25@ 3.50**
Standard mine run	St. Louis	1.85	1.95	1.85	1.65@ 2.00
Standard screenings	St. Louis	0.85	0.50	0.35	**0.50@ 0.60**
West. Ky. lump	Louisville	3.05	2.90	3.00	*2.60@ 3.25*
West Ky. mine run	Louisville	2.35	2.25	2.25	2.00@ 2.50
West Ky. screenings	Louisville	1.25	1.15	1.15	**0.80@ 1.75**
South and Southwest					
Big Seam lump	Birmingham	3.85	3.75	3.75	3.25@ 4.25
Big Seam mine run	Birmingham	2.15	2.15	2.15	2.00@ 2.30
Big Seam (washed)	Birmingham	2.40	2.40	2.30	2.15@ 2.40
S. E. Ky. lump	Louisville	3.50	3.65	3.55	**3.50@ 3.75**
S. E. Ky. mine run	Louisville	2.35	2.20	2.10	**2.15@ 2.25**
S. E. Ky. screenings	Louisville	1.55	1.50	1.25	1.25
Kansas lump	Kansas City	....	5.75	5.75	.....
Kansas mine run	Kansas City	....	4.00	4.00	.....
Kansas screenings	Kansas City	....	2.40	2.40	.....

*Gross tons, f.o.b. vessel, Hampton Roads.
†Advances over previous week shown in **heavy type**, declines in *italics*.

Current Quotations—Spot Prices, Anthracite—Gross Tons, F. O. B. Mines

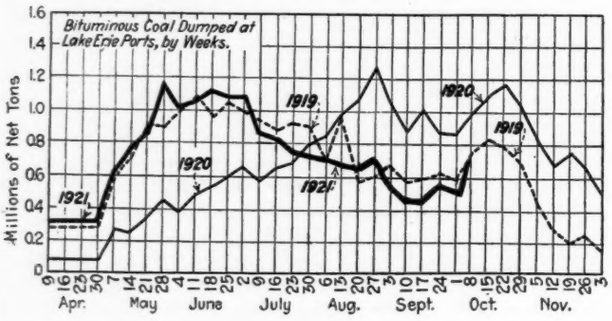
	Market Quoted	Freight Rates	Sept. 27, 1921 Independent	Sept. 27, 1921 Company	Oct. 4, 1921 Independent	Oct. 4, 1921 Company	Oct. 10, 1921† Independent	Oct. 10, 1921† Company
Broken	New York	$2.61	.....	$7.60@$7.75	.....	$7.60@$7.75	.....	$7.60@$7.75
Broken	Philadelphia	2.66	$7.60@$8.20	7.75@ 7.85	$7.60@$8.20	7.75@ 7.85	$7.60@$8.20	7.75@ 7.85
*Broken	Chicago	5.62	13.40	12.80	13.40	12.80	13.40	12.80
Egg	New York	2.61	7.75@ 8.25	7.60@ 7.75	7.75@ 8.00	7.60@ 7.75	7.75@ 8.00	7.60@ 7.75
Egg	Philadelphia	2.66	8.10@ 8.35	7.75@ 7.85	8.10@ 8.35	7.75@ 7.85	8.10@ 8.35	7.75@ 7.85
*Egg	Chicago	5.62	13.40	12.80	13.40	12.80	13.40	12.80
Stove	New York	2.61	8.25@ 8.60	7.90@ 8.10	8.25@ 8.75	7.90@ 8.10	**8.50@ 8.75**	7.90@8.10
Stove	Philadelphia	2.66	8.25@ 8.60	8.00@ 8.35	8.25@ 8.75	8.00@ 8.35	8.25@ 8.75	8.00@ 8.35
*Stove	Chicago	5.62	13.40	12.90	13.40	12.90	13.40	12.90
Chestnut	New York	2.61	8.00@ 8.25	7.90@ 8.10	8.00@ 8.50	7.90@ 8.10	**8.25@ 8.50**	7.90@ 8.10
Chestnut	Philadelphia	2.66	8.20@ 8.75	8.05@ 8.25	8.20@ 8.75	8.05@ 8.25	8.00@ 8.50	8.05@ 8.25
*Chestnut	Chicago	5.62	13.40	12.90	13.40	12.90	13.40	*12.80*
Pea	New York	2.47	5.00@ 5.75	6.05@ 6.45	5.00@ 5.50	6.05@ 6.45	5.00@ 5.50	6.05@ 6.45
Pea	Philadelphia	2.38	4.50@ 5.50	6.15@ 6.25	4.50@ 5.50	6.15@ 6.25	4.50@ 5.50	6.15@ 6.25
*Pea	Chicago	5.62	12.40	11.15	12.40	11.15	12.40	11.15
Buckwheat No. 1	New York	2.47	2.75@ 3.00	3.50	2.75@ 3.00	3.50	**3.00@ 3.25**	3.50
Buckwheat No. 1	Philadelphia	2.38	2.50@ 3.00	3.50	2.50@ 3.00	3.50	2.75@ 3.00	3.50
Rice	New York	2.47	1.80@ 2.15	2.50	1.80@ 2.15	2.50	**2.00@ 2.25**	2.50
Rice	Philadelphia	2.38	1.75@ 2.00	2.50	1.75@ 2.00	2.50	1.75@ 2.00	2.50
Barley	New York	2.47	1.25@ 1.50	1.50	1.25@ 1.50	1.50	1.25@ 1.50	1.50
Barley	Philadelphia	2.38	1.00@ 1.25	1.50	1.00@ 1.25	1.50	1.00@ 1.25	1.50
Birdseye	New York	2.47	.....	2.50	.....	2.50	.....	2.50

*Prices and freight rates, net tons; quotations f.o.b. cars, Chicago.
†Advances over previous week shown in **heavy type**, declines in *italics*.

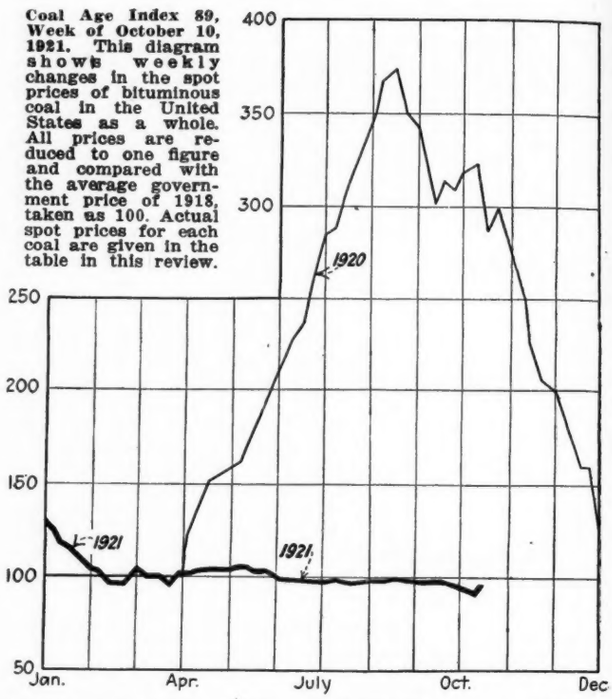
tons of soft coal were unloaded during the month. When compared with receipts in August, decreases of 201,337 and 421,460 tons, respectively, are shown.

RECEIPTS OF COAL AT DULUTH-SUPERIOR HARBOR DURING THE SEASON OF 1921

	Hard	Soft	Total
June	192,830	2,125,453	2,318,283
July	339,383	1,650,629	1,990,012
August	418,238	1,068,555	1,486,793
September	207,901	647,095	854,996
Total to Sept. 30, 1921	1,414,600	7,160,824	8,575,424
Corresponding period, 1920	1,048,650	4,127,491	5,176,141
Corresponding period, 1919	924,187	5,665,757	6,589,944
Coresponding period, 1918	976,420	6,228,244	7,204,664



Coal Age Index 89, Week of October 10, 1921. This diagram shows weekly changes in the spot prices of bituminous coal in the United States as a whole. All prices are reduced to one figure and compared with the average government price of 1918, taken as 100. Actual spot prices for each coal are given in the table in this review.



ANTHRACITE

Production of hard coal during the week ended Oct. 1 amounted to 1,832,000 net tons, according to the Geological Survey, or an increase of 78,000 tons when compared with the preceding week. The steam coals are in better position and prices for the independent product are nearing the circular figures of the old-line companies.

Lake dumpings of anthracite are decreasing. Loadings for the last week were 70,400 net tons compared with 100,320 tons for the week ended Sept. 28. Movement up the Lakes to Oct. 1, 1921, was 2,680,651 tons; in 1920 it was 2,406,661 tons.

COKE

Production of beehive coke continued to increase during the week ended Oct. 1. The total output was estimated at 82,000 net tons, 12,000 tons in excess of that for the preceding week and the largest since the last week in March.

Foreign Market And Export News

Coal Paragraphs from Foreign Lands

GERMANY — Production in the Ruhr region during the week ended Sept. 24, was 1,798,866 metric tons, according to a cable to *Coal Age*. This is a slight increase, as compared with 1,768,718 tons in the week preceding.

HOLLAND — Latest cabled quotations to *Coal Age* are: American gas, unchanged at $7, British steam 28s., c.i.f. Rotterdam. This is a drop of 4s. on British coal from last week's quotation.

SPAIN—Coal production in 1920 was 5,973,129 metric tons, or 53,000 tons in excess of the 1919 figure. Of the total output, 491,715 tons were anthracite, 4,928,989 bituminous and 552,425 lignite.

Demands have been made by the Spanish Coal Owners' Association that a customs duty of 7½ pesetas a ton be maintained on coal imported to Spain. The association also asks that coal used on Spanish warships shall be produced in Spain and that railway and steamship companies receiving Government assistance must use Spanish coal.

BRAZIL—Americans are taking an increasing interest in the possibilities for marketing coal in Brazil, according to *Commerce Reports*. Competition with Great Britain, however, is keen, for that Government subsidizes vessels carrying coal; and British industries and British-owned public utilities, especially railways, favor British coal. The British have invested large sums in bunkering facilities, and know from long experience how to handle the business, a knowledge which gives the Brazilians confidence in dealing with those firms.

Hampton Roads Continues To Mark Time; Mediterranean Markets Being Exploited

During the first few days of October the trend of the market has followed the dull pace set by September, when only 900,000 gross tons were dumped for all purposes, and a new low record nearly reached. The market is steady, however, and shippers believe conditions are bringing it to a more solid foundation.

Export business continues dull, but the coastwise trade is brisk. Exploitation of the Mediterranean ports as well as some of the South American fields is also going forward, and shippers hope to open new and fruitful markets in those sections.

During the week ended Oct. 6 accumulations at Tide increased somewhat, shippers apparently looking forward to better business during the late fall. Prices, in the meantime, remain where they have been for the last few weeks, with little reason for change in sight.

Shippers do not believe that the Hampton Roads coal business will suffer during the winter, although they do not hope for a revival of export trade at any time within the near future. Revision in certain port practices, they believe, will increase the bunker business. During the first week in October the general feeling in the market was optimistic; more so, in fact, than at any time within the last six weeks.

PIER SITUATION

	— Week Ended — Sept. 29	Oct. 6
N. & W. Piers, Lamberts Point:		
Cars on hand	1,353	1,316
Tons on hand	25,355	76,803
Tons dumped for week	99,741	53,653
Tonnage waiting	25,000	7,000
Virginian Ry. Piers, Sewalls Point:		
Cars on hand	1,386	1,675
Tons on hand	69,300	32,659
Tons dumped for week	76,000	83,750
Tonnage waiting	11,605	6,700
C. & O. Piers, Newport News:		
Cars on hand	1,401	1,432
Tons on hand	70,000	67,000
Tons dumped for week	41,482	60,038
Tonnage waiting	2,300	2,255

Grave Problem Faces British Coal Industry

South Wales Subsidy Dispute Closes Some Pits—Export Orders Dwindle—French Mine Stocks Increase — No Demand from Any Quarter

During the week ended Sept. 24 the output of the United Kingdom was 4,273,900 gross tons, according to a cable to *Coal Age*. This is an increase of 112,400 tons as compared with the preceding week.

September coal exports from Great Britain were 3,407,000 tons, compared with 3,103,000 in August. In September, 1920, 1,476,000 tons were exported and in September, 1913, 6,197,000 tons.

Honolulu interests have purchased 11,000 tons of South Wales coal. One cargo left Oct. 10, and the other is scheduled for Oct. 28. Few orders are being booked and both buyers and sellers are refraining from futures because of the uncertainty of the situation.

The coal industry in Durham is looking up momentarily as a result of an order from the Norwegian State Railways for 15,000 tons of screened steam to be shipped during October. In Wales the position is so bad that the Welsh Navigation Steam Coal Co., Ltd., has given 24 hours' notice to 1,500 men and executives. The pumps and ponies will be withdrawn from the shafts, and the length of the stoppage is indefinite.

Generally employment in the British coal mining districts declined during August, with the exception of South Wales and Monmouth where it was better than in July. On July 29, 8.1 per cent miners were unemployed, on Aug. 26, this had increased to 8.7.

French Market Is Overstocked

The position as regards available coal is quite satisfactory, in fact too much so, chiefly due to the lack of demand, and in regard to railway stocks, to the fact that these concerns had at certain times to take delivery of huge quantities of German coals. Consumers can go for a fairly long time without buying, as available stocks added to the production and imports under existing contracts are more than ample to meet even an unexpected brisk demand.

German coal deliveries will be controlled by the Office des Houillères Sinistrées direct with the German Kohlensyndikat. It is hoped that this will enable a better regulation of the supplies according to actual requirements, and that France will no longer have to take enormous quantities of fuel for which there is no call, and which at present is encumbering many concerns.

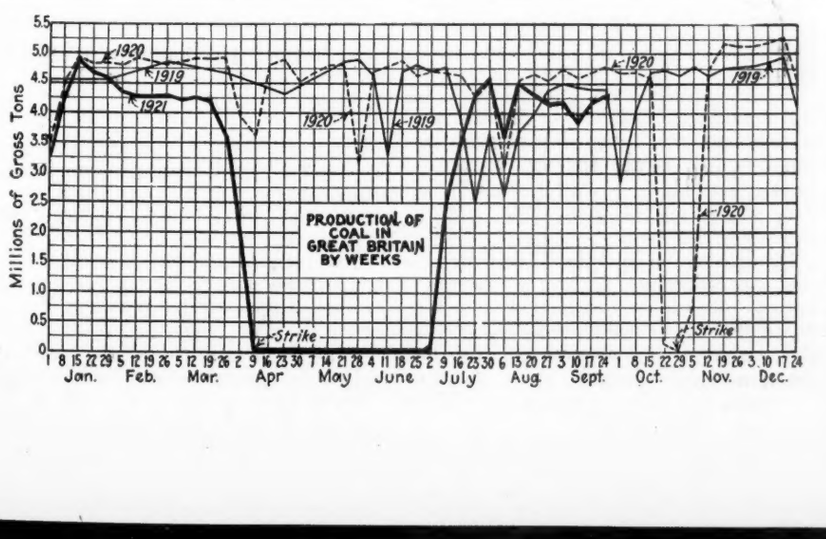
In the face of menacing British competition, operators in the Northern districts have informed their men that some means must be found to reduce the prices. A further discussion will be held on Nov. 12, when the question of wages will be definitely touched. English offers still flood the market but very little new business is being transacted.

Budapest gas works have completed arrangements whereby French mines will supply them with fuel. The arrangement permits the works to buy coal 10 per cent lower in price than was demanded by mines in Czecho-Slovakia and Upper Silesia.

French and Saar production for July, after deducting coal used at the mines, amounted to 2,012,000 tons. Adding the imports during the same month (660,000 tons) and deducting exports (321,000 tons), total quantity available was 2,351,000 tons, or hardly 40 per cent of the normal consumption. During July, French plants produced 56,000 tons of coke. Adding imports (279,000 tons, chiefly from Germany under the Reparation Act) and deducting exports (74,000 tons), this leaves for actual use 261,000 tons.

However, existing stocks at the French mines and elsewhere have to be taken into account, and same at the end of July were:

	Tons
At the mines	1,256,000
In various ports	600,000
Railway depots	1,347,000
Paris District gasworks	136,000
Other gasworks	250,000
Paris Electricity group	51,000
Total	3,640,000


Millions of Gross Tons
PRODUCTION OF COAL IN GREAT BRITAIN BY WEEKS
1920
1919
1921
Strike
Jan. Feb. Mar. Apr May June July Aug. Sept. Oct. Nov. Dec.

United States August Exports of Coal and Coke, by Customs Districts

Exports of coal and coke, by customs districts, from the United States in August, 1921, are shown in the following table:

	Coal: Anthracite	Coal: Bituminous	Coke
Customs Districts:			
Maine and New Hampshire	248	36	21
Vermont	1,172	227	27
Massachusetts	55	4	.....
St. Lawrence	105,701	155,094	1,671
Rochester	50,152	40,936	.....
Buffalo	193,493	188,217	5,873
New York	15,438	1,021	98
Philadelphia	988	84,064	56
Maryland	.....	66,597	.....
Virginia	.....	202,472	.....
South Carolina	.....	12,727	.....
Florida	.....	3,812	.....
Mobile	.....	268	.....
New Orleans	.....	1,021	3
San Antonio	1,458	2,681	2,075
El Paso	165	10,921	2
San Diego	14	2	.....
Arizona	1,100	.....	.....
San Francisco	.....	.....	7
Washington	42	1,186	.....
Alaska	.....	30	.....
Dakota	1,677	2,934	560
Duluth and Superior	563	1,739	123
Michigan	726	98,499	6,487
Ohio	13	820,602	1,024
Porto Rico	.....	.....	2
Total	373,005	1,695,090	18,029

BUNKER COAL SUPPLIED TO STEAMERS
(In the Foreign Trade)

Customs Districts:	
New York	241,638
Philadelphia	33,397
Maryland	22,685
Virginia	217,369

Pier and Bunker Prices, Gross Tons

(Foreign Bunker Quotations by Cable to C al Age)

	Oct. 1	Oct. 8†
PIERS		
Pool 9, New York	$5.75@$5.85	$5.75@$5.85
Pool 10, New York	5.50@ 5.60	*5.45@ 5.60*
Pool 9, Philadelphia	5.80@ 6.00	5.80@ 6.00
Pool 10, Philadelphia	5.40@ 5.70	5.40@ 5.70
Pool 71, Philadelphia	6.00@ 6.25	6.00@ 6.25
Pool 1, Hamp. Rds	4.90@ 5.00	*4.85@ 5.00*
Pools 5-6-7 Hamp. Rds.	4.25@ 4.40	4.25@ 4.50
BUNKERS		
Pool 9, New York	6.10@ 6.20	5.85@ 5.95
Pool 10, New York	5.85@ 5.95	6.10@ 6.20
Pool 9, Philadelphia	6.10@ 6.30	*5.80@ 5.90*
Pool 10, Philadelphia	5.75@ 6.00	6.10@ 6.30
Pools 9-71, Baltimore	.....	5.75@ 6.00
Pool 1, Hamp. Rds	5.00@ 5.10	*4.95@ 5.10*
Pool 2, Hamp. Rds	4.75@ 4.85	*4.65@ 4.85*
Welsh, Gibraltar	47s. 6d. f.o.b.	47s. 6d. f.o.b.
Welsh, Port Said	56s. 6d. f.o.b.	56s. 6d. f.o.b.
Welsh, Singapore	70s. ex. wharf	70s. ex wharf
Welsh, Rio de Janeiro	65s. f.o.b.	65s. f.o.b.
Welsh, Algiers	45s. f.o.b.	45s. f.o.b.
Welsh, Malta	50s. f.o.b.	50s. f.o.b.
Welsh, Lisbon	57s. 6d. f.o.b	57s. 6d. f.o.b.
Welsh, La Plata	60s. f.o.b.	60s. f.o.b.
Welsh, Madeira	52s. 6d. f.a.s.	52s. 6d. f.a.s.
Welsh, Teneriffe	52s. 6d. f.a.s.	52s. 6d. f.a.s.
Welsh, Genoa	55s. t.i.b.	55s. t.i.b.
Durham, Newcastle	35s. @ 37s	35s. @ 37s.
Belgian, Antwerp	110 fr.	110 fr.

C.I.F. Prices, American Coal

(In Gross Tons)

	Oct. 1 — Low Vol.	Oct. 1 — High Vol.	Oct. 8† — Low Vol.	Oct. 8† — High Vol.
French Atlantic	$8.75	$8.50	$9.00	$8.40
United Kingdom	8.80	8.60	9.00	8.70
West Italy	8.90	8.60	9.00	8.70
Scandinavia	9.70	9.25	9.80	9.70

These quotations are purely nominal and as far as can be learned, no business is being done in these markets.

Current Quotations British Coals f.o.b. Port, Gross Tons

Cardiff	Oct. 1	Oct. 8†
Admiralty Large	31s. 3d	30s. @ 32s. 6d.
Steam, Smalls	18s. 3d.	19s. @ 20s
Newcastle:		
Best Steams	27s. 6d.	27s. 6d.
Best Gas	27s. 6d.	27s. @ 28s.
Best Bunkers	27s.	27s.

†Advance over previous week shown in **heavy type**, declines in *italics*.

Reports From the Market Centers

New England

BOSTON

Slack Market—Hampton Roads Agencies Have Clear Sweep Through Most of the Territory — Operators Hold to Minimum Prices — Consumers' Stocks Large—Anthracite Fairly Active.

Bituminous—The current market presents every opportunity for improved selling methods. Continued pressure upon the Pocahontas and New River shippers to move accumulations at the loading piers has resulted in the lowest offerings of the season, not only lower than the same coals were offered during the late summer but needlessly low if there were a more intelligent grasp of conditions than most of the Hampton Roads factors seem to show. The record is one of steady forcing brought to bear on the buyer, and since a dozen or more different interests are participating in this dog-eat-dog policy the price level is more or less demoralized.

Well back to points considerably more than midway from Tidewater here to the Hudson River the cost of the smokeless coals is less than the quality grades all-rail from Pennsylvania, this being due chiefly to the rivalry between shippers. The current market, therefore, continues to be dominated by Pocahontas and New River, practically to the exclusion of Pennsylvania coals. The effect is also evident upon the smokeless shippers themselves, for in many instances they have been obliged either to scale down prices on contracts taken early in the year, or lose the tonnage. This seems poor preparation for another season, for in all likelihood buyers will defer purchases, in view of this year's experience.

The daily average receipts at the Hudson gateways bears out the general result of low prices at Tidewater. And at Philadelphia and New York piers the dumpings from day to day continue extremely light. There seems no encouragement whatever for Clearfield, Cambria and Somerset shippers, although doubtless a way will be found later on to increase shipments from these districts. A few operations have been able to work four to five days weekly, but these are cases where there are certain contracts on hand to provide a nucleus, the coal is of the highest reputation, and the sales staff is unflagging and vigilant.

Pennsylvania operators, for the most part, are adhering to their now well settled policy of selling at a price somewhat over cost, and no less. It is observed that there is much less slashing of prices to move output, and less, too, is heard of coal being sent forward either by rail or water without definite consignment.

With marine freights at a low ebb, 85c. being the rate on barges, 2,000 tons and upward, Hampton Roads to Boston, stocks on hand are noticeably large. Consumers of all degrees have tried to take advantage of bargains, but "bargains" have held right through to the fall, and now when $6.15@$6.25 is freely offered on cars Boston for New River coal, the territory can absorb only a relatively small tonnage.

Anthracite—Both companies and individuals have no trouble now in disposing of all domestic sizes, except possibly egg and pea. Once more there is a seasonal demand from the householder. In most cities and towns the retail dealers are active, in some cases for the first time in several months. Shipments of stove and chestnut are notably slow, and the "independents" are once more asking premiums that approach 75c.@90c.

Tidewater—East

NEW YORK

Demand for Domestic Coals Growing—Pea Coal Sluggish—Local Bituminous Market Quiet but Demand Better Inland.

Anthracite — There is a growing domestic demand and present indications are that consumers are not going to be caught napping this winter. Operators and wholesalers report a continued heavy call for stove and chestnut. Egg is sluggish in this market but shippers say there is a better demand along the line.

The lack of demand for egg coal, locally, at the present time, is attributed to the heavy tonnage of this size put in consumers' bins in the past spring and early summer. However, it is estimated that not more than about 80 per cent of the usual winter fuel has been put in cellars. There is practically no market for pea and large tonnages are being placed in storage.

There has been no improvement in the steam coal situation. Buckwheat is some weaker. Rice is accumulating rapidly and some distress tonnages were reported as having been offered here at around $4 alongside. Barley is holding its own.

Bituminous—The Inland demand is the one redeeming feature of the situation. Tidewater call is slow and has fluctuated considerably the past week. Consequently, the amount of coal on the local piers is small.

There is a better feeling, however, and it is believed the turning point is about here. Inquiries are gaining in number and indications point to the early booking of actual business.

With the growing tendency to use the old district designations and analyses in selling the various coals, operators and shippers are giving more attention to the marketing end of the business and are taking care to see that their salesmen become better acquainted with the qualities of the coals they are handling.

The better grades, such as Pools 9 and 10, are a little more active. Pool 10 is more prominent than a week ago. Some effort has been made to ship Southern coals—Pocahontas and New River—into this market, because of the dullness prevailing at Hampton Roads, and it is reported that quotations made to local consumers generally depend upon coals handled here, for Pools 1 and 2 have ranged $6@$6.25 alongside. Considerable of these Southern coals have been shipped to points along Long Island Sound at prices comparing favorably with those quoted by local houses for good grades handled at the local piers.

PHILADELPHIA

Anthracite Quickened by Cool Weather —Prices Unchanged—Steam Coals in Moderate Movement—Bituminous Unstable — Railroads Best Buyers — Tide Trade Negligible.

Anthracite—Thanks to some seasonable weather the city has seen the lighting of many new coal fires and retailers have received much new business. Usually the orders have been for single tons, but there have been many for smaller lots.

The big companies already announce that nut is fast getting into the same position as stove as regards their ability to ship promptly. The individuals can still take some orders for nut, but their situation is also much improved. Pea of course remains a slow seller. It is egg that is making trouble for every operator.

There have been no price changes, and September circulars are still in effect for all companies. There is no doubt that the independents would have at least increased stove, but conditions were not right, with the warm weather and falling demand prevailing at the beginning of the month. It can be taken for granted, however, that they will get their prices at least 75c. above company coal some time during the winter.

Steam coals are in moderate demand. Orders for buckwheat are coming in better volume, but rice is still burdensome. Barley maintains its improvement and seems to gain some.

Bituminous—There is nothing stable about the market, for at the times when the demand seems to flare up in one section it dies down in others. The consumer continues to use the strictest caution in purchases and is prone to

wait for quotations from many sources before actually placing orders.

Outside of the railroads themselves, little attention was paid to the threat of the railway strike, and while considerable railroad coal is going into stock at this time, it is believed that the coming of winter and short supplies have as much to do with it as anything.

Prices have remained firm during the past three or four weeks. Of course with so many new operators in the market there are wide fluctuations, but the average, as quoted in the Weekly Review, has been well maintained.

Tide shippers report a few inquiries recently, but these are so far below normal that little hope of an old-time resumption is hoped for in the near future. There are frequently entire weeks when there are no clearances of coal cargoes from this port.

BUFFALO

Signs of Better Bituminous Demand—No Great Immediate Activity Anticipated—Canadian Trade Dull—Anthracite Slowly Improving.

Bituminous—The shipper is keeping his ear close to the ground in expectation of the stir in business that is bound to come before long. He does not look for much of a boom, for the old-time export trade is not likely to come back for some time, as British competition has now returned. But there are some signs of greater activity in various branches of trade and though locally the demand has not felt it much it is sure to do so before long.

Canal-boat lines report the offering of an unusual amount of pig iron for Tidewater, but grain is moving so fast that the iron is mostly declined, for boats can handle grain much more rapidly.

One reason for the light bituminous movement of late is the lack of business in Canada and the effort to make Canadian coal meet the reduced demand in that territory. Canadians are so indifferent to our coal that they do not visit this market and our jobbers are not able to interest them to any great extent. Prices are much the same as formerly, with no particular improvement in the movement. Still a better showing is looked for this month.

Anthracite—Demand continues light. The amount coming in has been less than it was a month ago. It seems that more coal has been shipped West than East, mostly to take care of the summer surplus, but now, as the Eastern demand improves it is best to turn more of it in that direction. That the local movement is not satisfactory is shown by the cutting of some city retail prices. Independents are selling at about 30c. under the line companies and it will take some severe weather to bring prices up to that level.

It has been common during the winter months to get a dollar or more for this coal than is asked regularly and as soon as the consumer with money goes into the market he will pay it if coal from the usual source fails to come forward promptly.

Lake—Shipments are not up to last month, but are as good as last season at this time. Loadings for the week were 70,400 tons, of which 24,300 tons cleared for Duluth and Superior, 16,200 for Milwaukee, 11,800 for Racine, 10,500 for Fort William and 7,600 for Sheboygan. September shipments were 388,874 tons as against 385,700 for September, 1920, and for the season, 2,680,651 tons, as against 2,406,661 tons last year.

Coke—The trade goes along slowly. A big local furnace lately asked prices for the delivery of 45,000 tons of furnace coke, but it has now withdrawn the inquiry. The inference is that it will start up its byproduct ovens and hopes to be able to keep them going. Quotations: $4.50@$4.75 for foundry, $3.75@$4 for furnace, $3.25 for stock and $4 for chestnut size domestic, adding $3.64 for freight.

BALTIMORE

Soft Coal Trading Dull — Keen Competition Continues — Prices Low — Anthracite Demand Spurred by Colder Weather.

Bituminous—With a tang in the air that portends the near approach of winter the trade has failed to show the usual seasonal interest. Business conditions are reported as in a more hopeful state, but if there is anything like a boom imminent it is not reflected in immediate trading.

Ruinous competition continues and this is especially marked in bunkers. Pools 9 and 71 sold here during the week $5.85@$5.95, trimmed in bunkers. This means a net price f.o.b. mines of $2.09@$2.19. There are still sharp bargains being offered even in best grades of soft coal and, while they are not anything like the bunker prices quoted, it is not unusual to hear of sales of Pool 9 around $2.35 and Pool 71 at $2.50. Best lump gas coals also range $2.35@$2.50.

A most discouraging feature has to do with exports. So far there has been but one loading on export account during October. Bunker trading has also fallen off to a great extent. The situation, as in all the other Atlantic coast harbors, looks like a typical Sunday.

Anthracite—Buying continues light, although there is some sign of revival as the colder weather gets nearer. In the less affluential sections, in direct contrast to conditions a year or so ago, ordering has gone back to the ton and half-ton basis.

Because of the light ordering, no retail advances of much size are noted to take care of the wholesale price increases, both company and independent, that have been made in the past two or three months. It would not be at all surprising, however, if there were an advance at any time, as many of the dealers feel that they are now traveling on too small a margin of net profit.

Canada

TORONTO

Business Active — Anthracite Orders Keep Dealers Busy—Bituminous Coming from Nova Scotia.

Anthracite business has been quite active lately with the advent of cool weather. Dealers are busy making deliveries and anticipate a rush trade for some time as many have delayed their orders until late in the season.

Coal is coming forward freely from the mines and dealers have enough on hand to supply the demand for some time. Arrangements have been made for regular consignments of Nova Scotia coal by water.

Current quotations follow:

Retail:	
Anthracite, egg, stove, nut and grate	$15.50
Pea	14.00
Bituminous steam	11.00 to 11.50
Domestic lump	12.25
Cannel	16.00
Wholesale f.o.b. cars at destination:	
¼-in. lump	$7.75 to $8.50
Slack	6.00 to 6.75

Northwest

MINNEAPOLIS

Buying Becomes Active — Orders for Small Quantities—Coal Shortage Unlikely—Keen Competition for Business.

The first killing frost of the fall started active domestic ordering, though confined to smaller orders than common. Dealers are not encouraging larger orders than the buyer can readily pay for. From the financial standpoint, the present plan is preferable. Small orders which can be paid for within the succeeding month are much better than larger ones for whose settlement more time must elapse.

There is the customary complaint which comes in times like these, of ruinous low prices made, and how disrupting it is to business. This is a part of the trade ritual when things are dull and there is the usual keen competition for business. It is difficult to say how seriously it may be taken. Many firms which have been accused by competitors of taking business in quantities at figures below cost seem to display distressing commercial health in view of that fatal action.

Receipts at the docks have been declining, but the totals are the largest in the last four years, so the stocks are at least not discouraging, with two more months of navigation left. It would be much better for the trade, if the outward movement from the docks had been freer for the last month or more, so that there were a better space available for further receipts. But with the start of fall, the movement to the interior has been distinctly better.

The uncertainty as to requirements makes it impossible to figure very

closely as to whether the present stocks are sadly short or are approximately sufficient. Assuming a vigorous winter and a good demand for industrial consumption, and the present season is threatened with a shortage. But presaging a moderate or a mild winter and less than average industrial requirement, and the stocks will serve nicely.

MILWAUKEE

Market Dull—Consumers Indifferent in the Face of Assured Supply — Winter of Rush Deliveries Predicted.

With frosty weather only a few weeks away, and with less than 60 per cent of home bins filled, delivery facilities ought to be taxed to their utmost, but the outward flow from the yards is far from normal. It is becoming more and more evident that the masses will buy coal only as actually needed during the coming winter.

Consumers have become indifferent, especially now that they have been assured that there will be no coal famine. Coke shares with coal in the dullness of the market.

Coal has gravitated to the bargain counter. A department store is offering anthracite at $1 per ton under the prevailing rates at regular sources. Egg size sells at $14.95, chestnut $15.20, pea $13.45, and buckwheat $11.10. A charge of 75c. is added where coal is carried in. No less than two tons, nor more than six tons are sold to a customer. A Milwaukee dock company is a party to the innovation.

The crowded condition of the docks is reflected in the record of September's Lake receipts, which were the smallest since navigation opened, the totals being 102,492 tons of anthracite, and 193,892 tons of soft coal. Revised figures show the season's receipts to Oct. 1 were 747,722 tons of anthracite, and 2,040,072 tons of soft coal, against 573,707 and 1,053,805 tons respectively in 1920, a gain of 174,015 tons of anthracite, and of 986,267 tons of soft coal.

DULUTH

Better Movement Provides More Storage Space — September Receipts Are Lighter—Few Price Changes.

Coal men are working to the utmost to keep the local docks clear so that cargoes may continue to come and the lane be kept clear as far back as the mines. Increased orders, both from country dealers and their customers are being recorded every day, and with a falling off in receipts during September, it is not thought that any blockade of traffic will come.

September receipts at Duluth-Superior harbor aggregated 854,996 tons, as compared with 1,486,793 tons during August. Of soft coal, 647,095 tons were received, as compared with 1,068,555 tons in the preceding month. Anthracite receipts were 207,901 tons, compared with 418,238 tons during August. For the season to Sept. 30, bituminous receipts were 7,160,824 tons, or 3,033,333 in excess of the same period last year. Hard coal receipts were 1,414,600 tons, or 365,950 more than last year.

Prices remain much the same with screenings down to $3.50, but there are signs of a strengthening market. No further troubles are anticipated from dock fires, as stocks have been lowered by the price reductions on screenings and buckwheat. For the latter, prices have again returned to $7@$7.50 from a drop to $6 which was brought about by an excess of supply.

Inland West

ST. LOUIS

General Improvement Noted — Steam Market Still Quiet — Non-Union Coals Cut Domestic Movement.

The first touch of autumn weather has brought a fairly good demand. People who formerly bought high grades are going to the cheaper fuels. Standard and Mt. Olive are going to be the strongest in St. Louis this winter. The country call for domestic is unusually good.

There is no domestic business from southeast Missouri nor below the Ohio River on either side of the Mississippi on account of Alabama and west Kentucky coming in on non-union prices, with advantageous freight rates.

Country steam business is light. A fairly good movement of steam and domestic is noted to Omaha and some to the Kansas City market and a good through movement of all grades to Chicago and Northern territory.

Steam in St. Louis has improved, mostly, however, for storage purposes. Movement of hard coal and smokeless is slow. Gas house and byproduct coke is selling fairly well.

CHICAGO

Trade in Doldrums—Domestic Market Quiet Before the Storm—Less Distress Tonnage.

A number of operators were in attendance at the meeting of the Illinois Coal Operators' Association in Chicago last week. These men spent much of their time at the offices of their sales agents, or in calling on the trade themselves. They received some first-hand market information and it was difficult to find a more pessimistic lot of men.

The coal trade, on account of the colder weather, is trying hard to look up, but conditions do not justify an optimistic outlook. Steam coals are still weak although there has been a slight improvement during the last few days. Some of the cement plants in the Middle West, which have been operating fairly well all summer, are now planning on closing down for the winter months in view of the fact that the road building season is nearly over. These companies have stopped taking coal, and this has thrown an extra tonnage on the open market.

Retailers have succeeded in selling a few tons on account of the colder weather, and consequently some scattered replacement orders have been made, but there has been no real domestic business this year when one compares the volume of tonnage with other years.

The time is drawing near when the Chicago public will have to consider the coal question. When that time arrives, it is our prediction that there will be a pretty severe scramble for coal. Some of the more hopeful sales agents claim the demand will be good all winter as we are so far behind on requirements that it will be impossible to make up for lost time; others who have been sadly disillusioned all season claim that the domestic demands can be taken care of adequately in at least six weeks.

The smokeless market is holding fairly firm at $2.50 for mine run and $4.25@$4.75 on prepared sizes. Kentucky block as well as West Virginia splint is being sold $3.25@$3.75. Anthracite is moving slowly for this time of the year at prices strictly circular in nearly all cases.

CLEVELAND

District Improvement Appears in Industrial Market—Retail Demand Better —Hard Coal Advances.

A distinctly better tone has appeared in the coal market as a result of some improvement in the industrial situation and in the domestic demand. The most pronounced recovery has taken place in the iron and steel industry both in Cleveland and in the Youngstown district. In the steel industry, operations are on a basis of 50 per cent. This represents a gain of more than 100 per cent over the rate touched at the low point in July and August.

In Youngstown, independent sheet mills have booked sufficient orders to maintain production for from seven to ten weeks and operations are now at about 70 per cent of capacity in that district. In the steel industry, which overshadows all others in manufacturing importance in this district, the feeling prevails that the present rate of production will be continued or increased throughout the winter.

Some inquiries are being received for the future, but in the main the demand continues on a hand-to-mouth basis. This is due to the uncertainty as to the extent of the present revival together with the widespread belief that lower freight rates will become a fact in the near future. Railroads are taking only about two-thirds of the coal contracted for. Mine prices for industrial coal remain unchanged.

The recent chilly spell caused a sharp increase in retail demand in this city. One strong selling point which the retailers have this year is the pre-war quality of coal which is now available for distribution. During the rush the quality of coal deteriorated sharply. This was especially true of Pocahontas. Retail prices on anthracite

have been revised upward 25c. a ton, making stove and chestnut $14.50 and egg and grate $14.25. The advance was due to increases at wholesale.

Receipts of bituminous coal during the week ended Oct. 1 were 959 cars; divided, industrial 707, retail 252, as compared with a total of 1,014 cars the preceding week. However, the receipts for dealers show an increase of 76 cars over the preceding week.

CINCINNATI

Wide Price Spreads Hamper Buying—Smokeless Quotations Break — Screenings in Distress.

For the first time in weeks the market seems to have found a working level without a see-saw of divergent values and spreads in prices that were confusing, to say the least. For weeks those who have studied the situation have been struck by the tenacious effort on the part of some of the companies to hold fast to top prices in the face of a falling market. Sales agents say they have been hampered by the process of dropping the price to get business and then raising it as soon as a few orders showed in the wake. In consequence of this there was an immediate stoppage of business as soon as the price went up once more and a resumption when it fell. In the meantime, the jobber found the spot where the cheap coal could be had, and with a buyer's market to play, a steady stream of business was nearly impossible.

Producers of smokeless have been the most persistent in their attempts to hold to the high values, but without much avail, for slack is selling very close to the mark set by bituminous. The drop in price of the prepared coal still goes on without being hindered in the least by those who advance their prices as soon as a small flow of business is produced.

The descent in price, however, is looked upon in some quarters as being a bone for future contention, for, with the advertising campaigns of "buy coal now" that have been industriously carried on for months, it is feared that the public will hold off for some time to come. Sales agents are inclined to criticize the retailers for holding prices at the same level they were three and four months ago in the face of a drop in the spot prices.

DETROIT

Falling Temperatures Stimulate Domestic Market — Steam Inquiries More Frequent, but Buying Is Slow—Anthracite Demand Improves.

Bituminous—Steam consumers are not showing the interest that should be developing to assure a satisfactory supply for the winter. Inquiries are rather more numerous, but buyers still seem to be holding off, or making purchases in small quantities and at irregular intervals.

Some of the steam users are buying only when they find a chance to get coal at sacrifice prices, while others are apparently successful in providing for requirements by irregular purchases in the spot market.

Low temperatures have given a stimulus to the retail market. Dealers are receiving inquiries and orders in greater number than for many weeks and are making a strenuous effort to handle distribution that should have been under way during the summer months.

Pittsburgh No. 8 ¾-in. lump is quoted at the mines at $2.40, mine run $2.10, slack $1.65, Ohio 3-in. lump is $3.25, 2-in. lump $3, egg $2.50, mine run $2, slack $1.35. West Virginia or Kentucky 4-in. lump is $3.25, 2-in. lump $3, egg $2.50, mine run $2, slack $1.50. Smokeless lump and egg is $5.25, mine run $2.90@$3 and slack $1.60.

Anthracite — Supplies in retailers' yards are still adequate, with buying demand improving as the result of colder weather.

COLUMBUS

Better Domestic Demand—Lake Market Quiet—Steam Business Is Slow—Prices Are Unchanged.

With the thermometer ranging around the freezing mark, dealers in all sections have been buying more actively. Retail stocks are only fair. Rural dealers are still holding off to a large extent but city retailers are buying briskly. A canvass in Columbus shows that about the usual amount of winter fuel has been stored in comparison with former years. Retail prices are unchanged.

The Lake trade is becoming quiet, although a considerable tonnage was shipped from Ohio ports during the week ended Oct. 1. A large part of this tonnage came from West Virginia and Kentucky mines.

Steam business continues slow in every respect. Railroads are not taking much tonnage and miscellaneous demands are not increasing to any extent. Public utilities are about the only big customers at this time. Because of the larger production of lump, screenings are still weak, ranging $1@$1.20 and in some instances even lower. Reserves in the hands of manufacturing plants are still rather large.

South

LOUISVILLE

Increased Production of Prepared Sizes —Screenings Sluggish—Retail Distribution Growing.

With colder weather there has been an increased movement of prepared sizes, and the market is stiffer. Production is increasing and mines are averaging three to four days a week, with many running full time.

The market is unable to absorb the supply of screenings without heavier industrial buying, with the result that screenings are showing no price improvement over last week. Retailers report better business, there being many small purchases, and a fair sprinkling of good stocking orders.

Jobbers and producers are anticipating a stiffer market for block, and it is believed that fall prices will be steady shortly at $3.75 or better on coal from eastern Kentucky. There has been a very fair movement of western Kentucky lump into Louisville. Western Kentucky with a freight rate of $1.40 for all sizes as against a rate of $1.90 @$2 from eastern Kentucky has some advantage, but has maintained values better than eastern Kentucky this year.

BIRMINGHAM

Steam Slow and Weak — Current Buying Only — Cooler Weather Stimulates Retail Trade — Commercial Production Unimproved.

The steam market is very weak with no material improvement noted in either the source or volume of demand. All buying that is being done at this time is in the spot market and there is no disposition to take on more coal than is necessary for immediate use. Railroads and other contract interests are taking around their minimum quotas and are doing little stocking.

Steam quotations have varied only a little in the past few months. Several days of cooler weather has stimulated the retail trade and if the lower temperatures continue, retailers will be able to cut their stocks and resume shipments from the mines against contracts. At present, however, domestic operations are running irregularly and the output is not moved without trouble. Domestic mine prices for October are as follows: Cahaba and Black Creek, $5@$6; Corona, $4@$4.50; Montevallo, $7.25@$7.50; Carbon Hill, $4.25@$4.50; Big Seam, $3.25@$4.25.

West

DENVER

No Market Losses Disappearing — Decision Awaited on Wage Reduction.

Lack of market is gradually disappearing and activities show a favorable tendency toward a stable market. Production for the week ended Sept. 17 was 185,727 tons of a possible full-time output of 281,900 tons, while the week ended Aug. 20 showed an output of 147,598 tons of a possible production of 326,032 tons.

Operators are awaiting the decision of the state industrial commission in the matter of the proposed 30 per cent cut in wages inaugurated by the Colorado Fuel & Iron Co., but which was fought by the miners and resulted in a shutdown of some mines for ten or twelve days. The men are now working at the old wages.

News From the Coal Fields

Northern Appalachian

PITTSBURGH

Demand Increased But Little—Outlook Disappointing, Considering Season of Year—Iron and Steel Improvement Not Yet a Factor.

A slight increase in demand is reported, but on the whole the situation at the beginning of October was distinctly poorer than anticipated. In many quarters it was predicted three months ago there would be insufficient transportation as soon as weather came that was unfavorable to railroad operation. However, there are many idle cars and the railroads are handling the traffic so easily that they seem to have a good margin of safety against the time when the weather will make their operations more difficult.

Line demand has increased only slightly. The iron and steel industry, which has been increasing in activity almost continuously since the middle of July, is still at a very low rate of operation compared with pre-war times and there is little if any improvement in progress at present. Lake shipments have continued to dwindle until they are relatively unimportant. Demand for domestic coal, while improved, is distinctly disappointing.

Asking prices that have prevailed in the past few weeks are supported by actual market transactions, but there is no large volume of business, production being largely against contracts. Prices remain: Steam, slack, $1.65; mine run, $2.20@$2.25; ¾-in., $2.75; 1¼-in. domestic, $3.25; gas, slack, $2@$2.25; mine run, $2.25@$2.35; ¾-in., $2.55@$2.75.

CONNELLSVILLE

Operators' Price Ideas Advanced—Furnaces Cautious about Contracting — Merchant Production Increased.

The coke market has stiffened very distinctly in the past week, not so much on account of increased buying, but rather because of consumption prospects having improved and the near approach of winter. Whether the market will really be established at the higher levels now contemplated remains to be seen. The history of the trade presents many instances of improved prospects producing higher asking prices than could be maintained for any length of time.

Recent buying has given an operation to several producers who were anxious to run even if little profit were involved. Some operators state they will not sell on contract under $3.75, while one or two name $4 as their objective. On the other hand, some might shade $3.50, which is the minimum asking price at present, and a great deal of productive capacity might have to be engaged before consumers were faced with a $4 price.

Several furnace interests have been definitely or tentatively in the market for furnace coke to the end of the year, but they seem to be quite patient, and not anxious to blow in their stacks unless under very favorable conditions.

Spot foundry coke, while not quotably higher, is stiffer, with a somewhat broader demand. We quote: Spot furnace, $3.35@$3.50; contract furnace, $3.50@$3.75; spot foundry, $4.25@$4.75.

The *Courier* reports production in the week ended Oct. 1 at 14,400 tons by the furnace ovens, and 37,900 tons by the merchant ovens, a total of 52,300 tons, an increase of 8,540 tons.

CENTRAL PENNSYLVANIA

Demand Stronger for Better Grades—Wage Controversy Closes Some Mines—September Production Lighter.

September loadings were 55,405 cars or 3,175,650 tons, as against August production of 56,636 cars, or 3,247,130 tons. Only two months in the year had a lower production, April with 48,015 carloads and May with 55,225. September, 1920, had a production of 93,015 carloads.

Because of a reduction in wages, 150 miners employed by the Charles Coal Mining Co., east of Seward, along the main line of the Pennsylvania, failed to appear for work although no strike was formally declared. Mines at Marion Center, Indiana County, are also closed because of a refusal of the miners to accept a cut in wages. In Somerset County mining is showing some gains, and in sections mines that had been closed since spring have started operations.

UNIONTOWN

More Ovens Fired — Furnace Coke Firms Up With Better Inquiries—Demand for Coal Is Heavier.

Productive activity at coke plants continued to make gains, stimulated by the firm market tone and increased demands made by blast furnace interests. More than 600 ovens were added to the active list during the week.

In the market phase the principal development of the week was the receipt by operators of an inquiry by the Lackawanna Steel Co. for 15,000 tons of furnace coke per month for the remainder of the year. That inquiry has centered interest on the contract furnace market, and most operators who expect to submit bids concede that the figure at which the order is placed will establish the furnace contract market, for the remainder of the year at least.

For several weeks the spot furnace market has been quotable at $3.35@$3.50 but within the past few days the minimum figure has disappeared from sales. The Lackawanna inquiry has further stiffened quotations and it is possible that those operators who have been holding firmly for $3.75@$4 may be able to bring prospective buyers around to their point of view.

The demand for raw coal has increased considerably. It is noted, however, that consumers needing tonnage have gone direct to the operators. The result has been that a number of smaller coal plants have resumed operations without showing any reflection in spot quotations, those remaining at $1.50 for steam and $2 for byproduct.

FAIRMONT AND PANHANDLE

More Buying Interest Shown — R.R. Fuel Moving Better — Spot Sales Few.

FAIRMONT

Production was not much heavier during the first week of October, although inquiries were becoming more numerous. Contract shipments were limited, but railroad fuel was moving better; Lake tonnage was off and export business was at a low ebb. Mine run ranged $1.50@$1.75, slack was soft, $1@$1.40, and lump was $3@$3.50.

NORTHERN PANHANDLE

Commercial mines worked on a 25 per cent basis. Prepared sizes were in better call but the steam market was lifeless. Contract inquiries were stronger, but for the most part, did not bring closings.

UPPER-POTOMAC

No Improvement Yet—Many Mines Idle —Non-Union Competition too Stiff.

This first week of October brought no improvement in operating conditions. Production was almost at a standstill except in the case of a few larger companies. Western Maryland coal could not be sold in competition with the non-union fields. Mine run ranged $1.50@$1.75.

EASTERN OHIO

Production Increases with Better Industrial Conditions and Seasonal Domestic Demand—R.R. Buying Heavier—Lake Tonnage Unchanged.

A slight improvement in general conditions was felt by the coal trade during the week ended Oct. 1. Production was 366,760 tons or about 58.7 per cent of rated capacity, which volume of out-

put was greater than that of any week since mid-August. The total tonnage mined shows an increase over the preceding week of some 40,000 tons.

Accumulated output for the calendar year to Oct. 1 is estimated at 13,151,000 tons or 54 per cent of mine capacity, based on railroad ratings. Figures given out by the operators' association indicate that their mines worked 48 per cent of possible full time.

There is a better tone to industrial demand and the approach of colder weather is bringing about a considerable improvement in orders from retail dealers. With the increased business which is developing on the railroads, a stimulus is noticeable from that quarter.

As yet, there is no evidence of any change in the movement of Lake cargo coal, and the volume of tonnage being handled is about the same. The railroads have on hand daily at lower Lake docks a little less than 9,000 cars, and receipts from the mines average less than 2,000 cars per day.

Middle West

INDIANA

Steam Sales Coming Easier—Production Heavier—Trade Optimistic.

In spite of the rather cool weather there does not appear to be much increase in the domestic demand. An advance of 25c. on coke and two grades of anthracite is the only indication that winter is almost here. Other than these two increases, summer prices still prevail.

The outlook in the bituminous region southwest of Indianapolis is somewhat improved. There has been an increase in production and sales of steam coal are coming a little easier. Some of the utilities, fearing a car or coal shortage this winter, are storing some coal. There is an increase in industrial activity and this is creating some additional demand.

MIDWEST REVIEW

Better Domestic Movement — Steam Price Decline Halted—R.R. Strike Unlikely—Low Contract Quotations.

Weather conditions continue to affect the coal market to a marked extent; on account of a few nights with frost, the domestic demand has increased materially. The market on steam coal continues unsatisfactory. Cold weather may have some effect on industrial coal, but it is beginning to be doubted. The Middle West industries are still in poor shape, and not much activity is anticipated during the winter months.

Eastern coals at low prices are continuing to make serious inroads. This is because operators in southern Illinois are holding at $4.05 for the domestic sizes while producers in West Virginia and Kentucky are offering their coal freely at 75c.@$1.25 below this figure.

As soon as conditions become anywhere near normal, the Eastern operators are going to discover a hard time in store for them if they wish to retain their market in the Northwest. A great many roads serving Wisconsin, Iowa, Minnesota and the Dakotas, now have direct connections into the Illinois and Indiana coal fields. For instance, the C. B. & Q. taps the enormously rich southern Illinois fields. This road, as it extends through Minnesota and the Dakotas, publishes attractive through rates from mines on its own lines to points in the Northwest also on its own lines. The C. & N. taps the coal fields in the central and southern central districts of Illinois, while the Chicago, Milwaukee and St. Paul, through its recent acquisition of the Chicago, Terre Haute and Southeastern taps the best Indiana fields. It is expected when conditions become anywhere near normal again these roads will all take the necessary steps to see to it that their rates are advantageous and their service in the Northwest excellent.

The market on steam coals has not improved this week, although it has grown no worse. A great deal of tonnage has moved at the low prices established recently, but no lower. Steam buyers refuse to be influenced by any newspaper talk relative to a railroad strike, and it now appears their attitude in this matter is justified through a statement made by one of the high officials of the railway brotherhoods who declares that if a walk-out should be ordered half the workers would become "scabs," and the other half tramps. There may be some talk about a railroad strike, but this will not be taken very seriously.

Big buyers who usually contract, but who this year planned to buy a part of their requirements on the open market, now find they can, if they so desire, make contracts at low prices that would have been considered out of line last spring. It must be said that very few big steam buyers are taking advantage of these low prices at this date.

SOUTHERN ILLINOIS

Car Shortage Arrives at Many Mines—Slightly Better Tone to Steam Prices—Domestic in Good Demand—R.R. Tonnage Increases.

Carterville steam coal has shown a little improvement, principally on screenings, not so much in tonnage movement as in the price. Demand for lump far exceeds the supply and egg is about breaking even.

Railroad tonnage has been unusually good, but at many mines the small number of cars put in caused operations to remain idle while some are working short-time on account of no cars. The circular price prevails on lump and egg with both association and independent operators. The price on screenings range 75c.@$1.25, with mine run $2.35@$2.75.

The Duquoin situation is somewhat similar, both as to operating conditions and prices. In the Mt. Olive field considerable improvement is noted in the tonnage, both railroad and domestic. Steam sizes are hard to move and are going mostly on contract. The St. Louis price on domestic is $3.25; country price, $3.75.

The Standard situation is improving some, especially on domestic prices. Standard 2-in. lump is quoted $2.75@$3. Six inch is $3.25@$3.50, with nut and egg $2@$2.50. Screenings have strengthened to 50c.@60c. Railroad tonnage is fairly good but car shortage is showing up at many mines.

WESTERN KENTUCKY

Screenings a Little Stiffer — Demand Improves — Southern Movement Increases.

Cold weather has resulted in increased orders for prepared sizes, while mine run and screenings are in slightly better demand as a result of the increased consumption on the part of utilities. Movement into the South is increasing, with the cotton and agricultural situation improved and credit conditions better.

Western Kentucky during the past few months has improved her marketing facilities materially through securing better freight rates, and increased territory. The selling field for western Kentucky is better at the present time than ever before in the history of the district.

Middle Appalachian

LOW-VOLATILE FIELDS

Early Improvement Anticipated — Car Shortage Felt — Heavier Domestic Movement — Tide Tonnage Declines.

New River and the Gulf

New River production was hardly up to the level of recent weeks at the outset of October. Prices, even for prepared sizes, had declined to such a point that some smokeless was competing with high-volatiles. Tide shipments were small, but some coal was going to Inland East points with prepared sizes moving west under pressure. Slack was in even worse condition and ranged $1.25@$2. Cars were none too plentiful, indicating that a shortage might come before long.

Gulf producers generally anticipated an early improvement, but the output continued at the low rate of 40 per cent of capacity. It was, of course, the small Tidewater movement that made for the dullness, with the majority of the mines still shut down.

Pocahontas and Tug River

Pocahontas production exceeded 300,000 tons for the first time in recent weeks. The spot demand was picking

up somewhat, as had been anticipated. Car shortage losses amounted to 15,000 tons. Prepared coal movement was better, but at weaker prices and there was also an increased demand in Philadelphia and other Eastern markets.

Tug River tonnage was sustained at about 85,000 tons, the rate being better than in any other smokeless field. The improvement in the steel industry was contributing to the better demand for coal. Difficulty in securing equipment retarded production slightly.

HIGH-VOLATILE FIELDS

Heavier Buying of R.R. Fuel — Over-Production of Slack Continues — Car Shortage Appears.

KANAWHA

The daily output was about 14,000 tons in the week ended Oct. 1. A slight car shortage was noted although this did not affect the market. Prepared coal was in better demand, but slack was in distress, having a tendency to depress all prices. Lake orders were being filled rapidly.

LOGAN AND THACKER

After a brief period of demand, Logan conditions again relapsed into dullness. Notwithstanding this, production continued at the rate of 40,000 tons daily. An encouraging feature, however, was the heavier buying of railroad fuel.

Thacker production continued at about 50 per cent of normal. The output was sustained largely by contracts and increased railroad fuel tonnage, although the domestic market was slightly stimulated. The spot steam trading was quiet and slack was decidedly off-color.

NORTHEASTERN KENTUCKY

The output was still depressed to about 35 per cent of normal, but there was a general improvement to the market tone. The domestic demand was the strongest, at a wide price range of $3.25@$3.75.

VIRGINIA

The greater number of mines remained in idleness because of the poor demand, not more than 20 per cent of the producers being at work. Contract orders were just holding their own affording a run of 50 per cent of normal.

Southern Appalachian

SOUTHEASTERN KENTUCKY

Record Tonnage Being Produced — Prices Low But Outlook Improved — Domestic Trade Good.

More coal is being shipped from this section than ever before, and with industry getting slowly but steadily on the way to recovery and winter almost here, the outlook is better than any time during the year.

It is true that prices are low, in some cases below cost of production, but with a better demand for domestic and with a general improvement in conditions around industrial centers steam, as well as domestic should soon increase in price. In most cases, best grades of block have already been advanced 25c. and the increase seems to be holding so far.

West

UTAH

Domestic Demand a Question of Temperature—Prices Uncertain, with Upward Trend.

Although many people are placing storage orders, the majority are buying from hand-to-mouth. Prices are becoming unsteady again although it is but two weeks since they were revised. The tendency is upward now, but no definite information concerning the proposed increase is obtainable at this writing.

The car supply is excellent, as is also the labor situation. Mines are averaging around 65 per cent, with one or two of the medium-sized companies running full time.

News Items From Field and Trade

COLORADO

Fire in the Nushaft mine of the **Colorado Fuel and Iron Co.**, near Florence, raged for nearly forty-eight hours and spread over a forty foot surface of the face of the mine before it could be put under control. A miner encountered the shaft of an abandoned oil well which had been driven through the mine, and the supposition is that oil and gas from the well were ignited by the miner's torch.

ILLINOIS

The entire output of seven mines of the **Springfield District Coal & Mining Co.**, has been taken over by the **Peabody Coal Co.** The mines are located at Auburn, Cora, Riverton, Springfield and Taylorville. The Peabody Coal Co. opened up a branch office in Springfield in order to facilitate the handling of the shipments from these mines.

Following is the itinerary of the **Illinois Mine Examiners Board** for the month of October as announced by Robert Medill, Director of Mines and Minerals of Illinois: Harrisburg, Oct. 4; Herrin, Oct. 5; West Frankfort, Oct. 6; Sesser, Oct. 7; Belleville, Oct 10; Staunton, Oct. 11; Springfield, Oct. 12; Lincoln, Oct. 13; Danville, Oct. 14; Pontiac, Oct. 15; Peoria, Oct. 17; LaSalle, Oct. 18.

Over 600 men were thrown out of work recently when the **Illinois Coal & Coke Co.**, at Girard and the **Standard Oil Co.**, at Shoper closed their mines down until the market took a change for the better.

The Appellate Division of the State Supreme Court has handed down an interesting decision in a case brought by the American Steel Spring Co., Chicago, against the **Bell & Zoller Coal Co.**, of the same city, upholding a verdict rendered in favor of the coal company by a lower court, in the contention that coal furnished by the company carried no guarantee against ignition by spontaneous combustion. In its decision, the court says that a general agent to sell coal has no implied authority to warrant that it will not ignite by spontaneous combustion, and whoever relies on such a warranty must either show express authority to make the warranty, or a custom to give such warranty in making such sales, before the principal, or coal company represented, will be bound. In the case at issue, there is no evidence that it was usual for coal salesmen in taking orders for coal to warrant that it would not ignite by spontaneous combustion, and the plaintiff failed to make out a case.

C. M. Wasson of Harrisburg has returned to his home after spending some time at his summer home in Michigan. He is connected with the Wasson Coal Co., operating in Saline County.

John S. Reiner, president of the Reiner Coal Co., Chicago, recently returned to his office from an inspection trip through the coal fields in southern Illinois.

The mine of the **Pana Coal Co.** at Pana has been temporarily shut down on account of a fire which broke out in one of the main entries of the mine recently.

The Illinois Coal & Coke Corporation is now planning to sink a new mine in Jefferson County near Waltonville. It will be modern in every way and the company will lay out a townsite near the mine.

The Producers Coal & Coke Co., has been organized with offices at 29 La Salle St., Chicago, to handle Eastern and Western steam and domestic coal. Chas. A. Klotz is president, and Norman D. Birkland and Frank A. Warren are vice-presidents.

The Big Four R.R., has announced that it will place a limit on the supply of coal cars available to each southern Illinois mine. The round-robin system by which different companies are given available cars strictly in rotation has been adopted.

INDIANA

Walter C. McLoud and **Edward Shirkie**, both coal operators of Terre Haute, are named as directors of the Coats Steamers, Inc., a company organized for the manufacture of steam automobiles.

Suit for $40,000 damages, charging breach of contract, and for $21,755 on account, has been filed in superior court, Indianapolis, by the **Black Comet Coal Mining Co.** against the Indianapolis Street Ry. Co. The plaintiff says it entered into a contract in September, 1920, to ship from twenty to thirty cars of mine run each week to the defendant company until April 1, 1921. The plaintiff says the defendant received and paid for coal shipped in October and November, 1920 but did not pay for 6,043 tons received by it in December, 1920, and January, 1921. The $21,755 suit on account is based on this claim. An official of the street railway company said it secured priority orders for freight cars to ship coal from the Black Comet company, and that the mining company used the cars for shipment to other places forcing the Street Railway Co. to buy on the open market at prices in excess of the contract figure.

Dr. W. N. Logan, geologist under the Indiana conservation department, and field party consisting of several scientists on the faculty of Indiana University, have completed a systematic survey of the coal-bearing rocks of the northern portion of the coal area of Indiana, according to announcement made by Richard Lieber, conservation director. The area studied includes the whole or portions of Clay, Vigo, Vermillion, Parke, Fountain, Warren and Benton counties, and adjoins on the north the area surveyed last year.

Glenn Van Auken, George M. Barnard and Edgar M. Blessing, members of the Indiana Public Service Commission, and A. B. Cronk, attorney and freight rate expert in the employ of the commission, will conduct a hearing on the petition of the Chicago & Indiana coal railway division of the Chicago & Eastern Illinois to abandon the division. R. B. Coapstick, attorney for the State Chamber of Commerce, intends to put on between sixty and seventy witnesses against the abondonment proposal, the commission has heard. The commission will hear the case for the interstate commerce commission, to which the petition was addressed.

The Big Four Mine at Boonville has been worked out and machinery is now being moved to the new Liberty mine, northeast of Princeton.

The Peoples Ice & Fuel Co., Vincennes, has increased its capital from $10,000 to $50,000.

KENTUCKY

The Millers' Creek Excelsior Coal Co., has been incorporated by H. W. Fraight, president; T. B. Lane, vice-president and general manager.

The Northeast Kentucky Coal Co. which is under the active management of Henry LaViers of Paintsville has hit upon a most novel plan for utilizing the rock and slate taken out of its mines. Near the tipple a rock crusher has been installed and the slate and rock after being crushed is loaded into cars through a bin and is used in the construction of roads so that the company is realizing even on what would ordinarily be considered a waste product.

The Ellaura Coal & Coke Co., recently organized in Kingsport, is arranging for the operation of coal properties in Lee County. The company will issue bonds for $30,000, the proceeds to be used for the purchase of equipment for installation at the site. It is proposed to construct a railroad, about two miles long, to reach the mines. James L. Nixon is president, and Charles J. Kesner, secretary-treasurer.

Colonel Wolf, of New York, president of the Kentucky King Coal Co., a large operation on Wallins Creek, has been visiting the mine.

D. S. Riddle, of the Riddle Coal Co., Chattanooga, was in Pineville recently.

James Gatliff, of the Southern Mining Co., Knoxville, was a recent visitor in Pineville.

Hal Mould, general manager of the Peabody Coal Co., Syndicate No. 2, with headquarters at Pineville, was chosen as governor of the Tennessee-Kentucky Kiwanis Club at convention held in Memphis. The delegation attending the convention, included the following Kentucky coal men: **W. R. Morrison**, of the Utility Gas Coal Co; **T. R. Ware**, interested in Straight Creek operations; **W. L. Moss**, of the White Moss Coal Co. and **Richard Barker**, of the Boone Trail Coal Co.

MINNESOTA

Dean W. R. Appleby of the state university school of mines and **Professor W. H. Emmons**, of the geological department, recently returned from an investigation of the coal and iron deposits of Manchuria.

Ivan Bowen, member of the Minnesota Railroad and Warehouse Commission, has been named chairman of a committee appointed by the joint congressional commission of agricultural inquiry. This committee is to analyze the marketing and transportation of coal. Mr. Bowen with five other uti'ity commissioners will conduct a nation-wide inquiry into the coal trade.

NEW YORK

J. E. Gaskill, of the Southern Coal Corporation, with headquarters at Fairmont, has been in New York on business.

The Wyoming Valley Coal Co. is the reported purchaser of a plot of ground containing 45,000 square feet at the southeast corner of Sixth street and Second avenue, Brooklyn. This property adjoins the company's present plant on Gowanus Canal and on it will be erected large coal pockets equipped with modern machinery.

Joseph Mehr, formerly with *Coal Age*, has been appointed fuel engineer and manager of the coal department of the Adria Steamship & Commerce Corporation, 17 Battery Place, New York City.

J. B. Roberts will represent the Nicholson-Smith Coal Co. of Cleveland in Buffalo. The company is opening an office in the Marine Trust Bldg. He was formerly vice-president of the P. O. McIntire Coal Co., of Cleveland.

OHIO

P. H. Henry, president of the Kentenia Coal Sales Co., recently renewed old acquaintances in Cincinnati. He is now located in the New York office.

E. M. Poston, president of the New York Coal Co., and one of the best known operators in Ohio, was appointed a member of the national unemployment conference by President Harding.

W. R. Chatfield, general manager of the Paragon-Elkhorn Coal Co. in Pike County, Ky., visited the Cincinnati market recently.

Effective Oct. 1, the **Elk Coal & Coke Co.** will handle its West Virginia and Kentucky business from the Columbus office, at 805 Ferris Building.

A recent visitor in the Cincinnati market was **Quin Morton** of Charleston, president of the Wood-Morton Fuel Co.

Recent charters issued to coal producing companies were: **Pleasant Valley Coal Co.**, Cleveland, $75,000, E. M. Kossin, M. B. Pennell, A. W. Bell, George O. Willett and L. E. Geil; **Humphrey Coal Co.**, Cincinnati, $25,000, J. M. Humphrey, E. C. Humphrey, Thomas Dew, Thomas L. Tallentire and David Lorbach; **East Richland Coal Co.**, St. Clairsville, $60,000, W. J. Walker, W. R. Thompson, Jennie Thompson, Walter Gongola and Lewis Drycek.

Notices of dissolution of the partnership of the **Packard Coal Mining Co.**, and also the **Franklin Mining Co.**, have been filed. The partnerships have been succeeded by a corporation styled the **Packard Coal Co.**, with offices at Columbus. M. L. Yuster is at the head of the corporation which takes over the properties, located in the Hocking Valley.

George H. Baker, vice-president of the Maynard Coal Co., has been named a trustee of the Ohio Weslyan University of Delaware, to succeed the late Z. W. White of Columbus.

The B. C. Tucker Coal Co., Cleveland, was recently incorporated at $100,000. B. C. Tucker, formerly president of the Lake City Coal Co., is president of the new concern, and John Keefe and Harry Abels, formerly with the Lake City Coal Co., are associated with Mr. Tucker in his new enterprise.

Suit has been entered at Athens by the **Hocking Coal Co.**, against the **Carbondale Coal Co.**, claiming $330,000 damages for the removal of 650,000 tons of coal from the plaintiff's property and other acts which are construed as damages.

W. J. O'Toole, president of the Central Pocahontas Coal Co., with headquarters at Welch, W. Va., was in Cincinnati recently on a business trip.

The Mullins coal mine of the **Underhill Coal Co.** of Cleveland has resumed operation, after being idle since April 1 for repairs, overhauling and equipment costing $15,000. One hundred men returned to work.

OKLAHOMA

Two men have been arrested and placed in jail at Henryetta, following what is believed to have been an incendiary fire that destroyed several buildings and mine property of the **Consolidated Fuel Co.**, at its No. 3 mine, near Henryetta. The loss is estimated at $10,000.

The Hotton Coal Mining Co., has been organized at Henryetta, with a capital stock of $10,000. The incorporators are: R. F. Wise, Earl Wells and H. E. Wise, all of Henryetta. The company owns some coal land leases near Henryetta which it is planning to develop.

The Hailey Okla. Coal Mining Co., has opened a new mine near Haileyville. This mine is really a continuation of an old operation which was worked through a shaft in the heart of the town of Haileyville. The new shaft is about one mile west of the old one.

PENNSYLVANIA

The forestry department of the **Philadelphia and Reading Coal and Iron Co.** announces that great success is being met with in the planting of pine and Norway spruce trees in the Pottsville region. The company intends to reforest its entire tract, comprising nearly half of the Schuylkill coal region.

The manslaughter case against **Thomas Elliott**, of Brownsville, on account of having run over a little girl with his automobile and killing her on a street of Brownsville several months ago, has been dismissed. Mr. Elliott is president of the Lilley Coal Co., operating a large mine near West Brownsville.

Chief Button, of the State Department of Mines, is compiling a list of all anthracite collieries which have suspended, giving the Kohler mine cave legislation as the reason.

The Girard Mammoth Coal Co. lost its $1,000,000 suit against the **Raven Run Coal Co.** when the court recently dismissed the bill of injunction granted the Girard company and refused to direct specific performance of a contract. The case involves the ownership of lands of the Raven Run company, worth $1,000,000. It is alleged the Raven Run company agreed to sell out to the Girard company, but the deal was called off when the question of some of the land titles became involved. As a result, the Raven Run company held the $20,000 deposited as a guarantee. Efforts were made by the Girard company to go through with the deal with the Raven Run company.

Coal shipments by the Monongahela River in August were 893,700 tons, an increase of 102,400 tons over July.

Thomas F. Gilbride has sold his interest in the **Blakely Red Ash Coal Co.** Payment for his share of the property is to be made in royalties running from 50 to 75c. a ton.

State charters issued include those for the following companies: **Clearhill Coal Mining Co.**, Burnside, capital stock $150,000; treasurer, William C. Browne, Burnside, Incorporators: William C. Browne, Burnside; M. H. Makey, Altoona, and George A. Potter, Altoona. **Brinkley Coal Co.**, Youngwood; capital $25,000; treasurer, S. J. Silliman, Youngwood. Incorporators: W. S. Brinkley, E. M. Bennett and Frank Brush, Youngwood.

Jesse W. Powell, treasurer, has notified the Secretary of the Commonwealth that the capital stock of the **Silver Lake Coal Co.** has been increased from $5,500 to $300,000.

The Public Service Commission has dismissed the complaint of the **St. Clair Coal Co.**, Schuylkill County, against the Eastern Pennsylvania Light, Heat & Power Co. The complainant filed objections to increased rates of the respondent, effective in 1919 and 1920. In an order the commission finds that the power company rates are not unreasonable and not unjustly discriminatory, as claimed.

TENNESSEE

The Black Mountain Coal Products Co. of Pittsburg has purchased 50,000 acres of coal land near Spring City, Tenn, about 60 miles from Chattanooga, and will spend about $1,900,000 in the development of the property to a capacity of 15,000 tons a day.

O. P. Pile, Chief Mine Inspector, for Tennessee, announces that he will hold an **examination for mine foreman** in Knoxville, from Oct. 18 to 20 incl. This examination will be held in the assembly rooms of the Atkins Hotel.

James M. Adams, secretary of the Sewanee Fuel and Iron Co., of Chattanooga, and James M. Wills, Southern sales representative of the same concern, have applied for charter for **Sewanee Coal Co.**, authorized capital $25,000, to be located in Atlanta Ga., and are opening offices there for wholesale handling of coal and coke.

TEXAS

J. B. Robinson, of Rockdale, has organized a company among coal operators of Pittsburgh, Pa., and Ba'timore, Md., which will soon enter the field of lignite mining at Rockdale. The company has secured a 50-year lease on 306 acres of land in Milam County and work of building a spur track to the property and erecting handling facilities is now under way.

Formal petition for a permit for the erection of a coal and fuel bunkering plant on a 20-acre tract at Manchester on the Ship Channel near Houston, has been filed with the City Commission by **W. C. Hogg** and **V. H. Borsodi**. The plant wi'l be equipped for supplying ships that call at Port Houston, and also for handling coal cargoes that are shipped in.

WASHINGTON, D. C.

The House Committee on R'vers and Harbors will give a hearing on Oct. 25, on bills to prevent the discharge of oil and other waste into navigable streams, which affect discharges from coal mines. It is said that in a former Congress the measure was defeated by a Pennsylvania representative on the committee who objected to its application to the coal industry. Representative Strong, of Pennsylvania, a member of the present committee, represents a coal mining district and will probably look out for coal interests which might be affected.

Representative Herrick, Oklahoma, has introduced a bill proposing a standard wage and commodity price which he claims will solve the unemployment problem and prevent strikes. He proposes that a special committee of the House shall report a proposed law for consideration by Congress.

WEST VIRGINIA

Under authority granted by the secretary of the state the name of the **Ryan Coal Co.** has been changed to the **Clarksburg Gas and Coal Co.** and hereafter the general office of this company will be at Wheeling instead of Fairmont.

There is strong possibility of the construction of a new railroad through Gilmer County, which will open the rich coal resources of that county. The county court has authorized a special election to vote on the question of issuing $100,000 in bonds for the purpose of doing preliminary work on the railroad. If the railroad is built it will follow the river route, often impassable in winter. It is proposed to build the road from Gilmer station, where connection would be made with the Charleston Division of the B. & O. for a distance of 16 miles to Glenville, the county seat. It is also planned to extend the road through Gilmer and Wirt counties to Palestine in order to effect a juncture with the Ohio and Little Kanawha.

At a time when there has not been so much activity in the production of coal the **Lake Superior Coal Co.** of Superior, in the McDowell County field, has relined its shaft at No. 2 mine. This was accomplished without in any way suspending or retarding the use of the shaft for the mining of coal.

Organization of the **Brooke County Coal & Coke Co.** with a capital stock of $430,000 presages the development of coal lands in Brooke County. Wellsburg is to be the headquarters of the company in which R. L. Ramsey, J. R. Elson, W. S. Wilkin, S. S. Hodges, all of Wellsburg are interested, together with C. M. Warden of Beech Bottom.

The Dixie Pocahontas Coal Co. of Huntington has been organized. This company is capitalized at $100,000. Leading figures in the organization were James F. Poindexter, Joseph Maloney, John S. Marcum, J. R. Marcum and C. D. Poindexter, all of Huntington.

Construction work on an extension of a spur from Norton to one of the mines of the **West Virginia Coal & Coke Co.** has been completed.

Lee Hutchinson, in charge of the Cincinnati branch of the company was at the general offices in Fairmont recently.

Judge William S. Bennet, chief counsel in Chicago of the Edward Hines Lumber Co., owning much coal property in Marion County, has been visiting in Fairmont.

W. D. Boone, of Lookout, well known in smokeless circles, spent a few days in Charleston recently.

M. L. Hutchinson, of Fairmont, president of the Hutchinson Coal Co., was in Philadelphia on a business mission recently.

Harry Whyel, one of the well known operators of the Uniontown section, who recently returned from a trip to Europe, was a visitor in Fairmont recently.

Roy H. Cunningham, of Huntington, manager of sales for the Twin States Fuel Co. was in the Detroit market recently.

H. D. Everett, manager of sales of the Smokeless Fuel Co. of Charleston, has returned from a business trip to Chicago.

O. W. Gardner of Lynchburg, Va., president of the Chesapeake & Virginia Coal Co. was a recent visitor at the Huntington office.

WISCONSIN

The Consolidated Fuel Co. of Chicago has entered the Milwaukee market and is storing coal on one of the docks of the Kanawha Fuel Co.

The Maynard Coal Co., of Columbus has made extensive repairs and improvements at its docks at Superior. The new capacity will be in the neighborhood of 1,000,000 tons. The improvements will be completed by the opening of navigation in 1922.

Traffic News

The Clay County (Ky.) Coal Operators' Association complains to the commission against unreasonable rates on coal from mines on the Cumberland and Manchester R.R. to various interstate destinations and asks for rates the same as apply from Barbourville, Ky, and other contiguous stations.

The Little Fork Coal Co. of Willard, Ky., complains against unreasonable rates on coal from Willard to Cincinnati and other points in C. F. A. territory.

Reduction of Coal rates has been announced by the **O. S. L. R.R.** This means that the coal of Kemmerer, Cumberland and Rock Springs, Wyo., may be shipped to Utah on the same basis as that which comes from Castlegate district in Utah, as far as the smelter district from Sandy north, including the International, is concerned. Rates on coal were last advanced 25 per cent, when the I. C. C. authorized such an increase and this increase is to be taken off. Utah operators are not averse to the competition which will result from the heavier shipments of Wyoming coal into the Utah field, but feel there should be an equitable adjustment in the other direction. As it is, Wyoming coal can be shipped to Idaho, Oregon and other points cheaper than Utah coal. Unless the railroad company changes its plans it is stated that any application it may make to alter its rates on coal coming from Wyoming to Utah will be resisted. It is held that the Utah mines should now be placed on a parity with Wyoming operations.

Application of the Bamberger Electric R.R. which was made to the Utah Public Utilities Commission for an order to compel the **Utah Ry.,** the **D. and R. G.,** and the **Salt Lake Route** to establish joint through rates on coal from the Utah Railway terminals and points to Ogden by the Bamberger line, has been dismissed by the commissioners. It was held that there was no necessity for such action.

In telegrams addressed to members of the Portsmouth and Cincinnati sales agents for coals originating on their lines, the **Norfolk & Western** has asked for possible business anticipated by their companies for the next month. These telegrams say that the increase in business has been such as to force them to make a call on connecting lines for empties.

The Crookston Gas Co., has complained to the I. C. C. against unreasonable rates on coke from St. Paul, Minn., to destinations in Minnesota.

In the complaint of the **Michigan Paper Mills Traffic Association,** involving rates on coal from the Ohio and inner and outer crescent fields to points in Michigan and Indiana, the commission has authorized the **Grand Rapids Association of Commerce** to intervene.

During the second quarter of 1921 the I. C. C. reports that 435,046 cars of 21,254,080 tons of anthracite coal, 1,284,931 cars of 65,908,865 tons of bituminous coal and 45,776 cars of 1,563,567 tons of coke were transported by railroads.

In the complaint of the **Michigan Paper Mills Traffic Association,** involving rates on coal from the Ohio and inner and outer Crescent fields to points in Michigan and Indiana, the I. C. C. has authorized the Kalamazoo, Mich, Chamber of Commerce to intervene.

The complaint of the **Illinois Coal Traffic Bureau** has been assigned for hearing at Chicago Oct. 25 and the complaints of the **International Coal Products Corporation** has been assigned for hearing at Washington Oct. 18.

The American Smelting and Refining Co., has requested the commission to reopen for argument and rehearing its case in which the commision recently decided that the demurrage charge and average free time at Baltimore on coke for export in 1918 was not unreasonable.

Association Activities

National Retail Coal Merchants' Association

The executive committee and directors of the association met recently at Indianapolis. The meeting of the committee was called to devise an immediate plan to convince the public of the importance of buying coal early. Should Indianapolis feel inclined to extend an invitation for the next national convention, the city would have no trouble obtaining it, it was said.

Northeast Kentucky Coal Association.

Officers and directors of the association piloted 150 members of the Ashland Chamber of Commerce on a trip, made by special train, through the coal territory adjacent to the Big Sandy River, a coal territory in which $30,000,000 has been invested within the last eight or nine years and where 180 mines are now in operation, although limited railroad facilities have confined the development of the Miller's Creek and Elkhorn Byproduct seams to the western side of the Big Sandy.

Ashland being to the Big Sandy field what Huntington, W. Va., is to Logan, a trading center for the Big Sandy, it was desired by the Chamber of Commerce not only to learn something of the richness of the region tributary to Ashland but also to better acquaint the mining communities with the possibilities of Ashland.

Recent Patents

Power Shovel for Use in Mines. Clyde S. Corrigan, Norwood, Ohio, 1,389,421. Aug. 30, 1921. Filed July 15, 1920; serial No. 396,391.

Rock Drill. Thomas Turner, Ottumwa, Iowa, assignor to Hardsocg Wonder Drill Co., Uttumwa, Iowa, 1,389,539. Aug. 30, 1921. Filed April 4, 1918; serial No. 226,754.

Power Shovel for Loading Mine Cars. C. S. Corrigan, 504 W. 158th St., New York, N. Y.; 1,389,421, filed July 15, 1920. Serial 396,391.

Lamp-Supporting Attachment for Miner's Caps. William Israel, Kingston, Pa., 1,383,721. July 5, 1921. Filed June 21, 1918; serial No. 241,305.

Miner's Breastplate. W. H. Davis, Accoville, West Va., 1,383,909. July 5, 1921. Filed May 21, 1920; serial No. 383,197.

Mine-Car Wheel. Frank E. Johnson, Salt Lake City, Utah, 1,383,309. July 5, 1921. Filed Nov. 10, 1919; serial No. 336,956.

Universal Coal-Cutting Machine. A. L. Chopin, Paris, France, 1,384,236. July 12, 1921. Filed July 7, 1919; serial No. 309,127.

Method of Transporting Coal. William E. Hamilton, Columbus, Ohio, 1,385,447. July 26, 1921. Filed Feb. 8, 1919; serial No. 215,995.

Miner's Drill Holder. Christopher Devenish, Bossburg, Wash., 1,385,523. July 26, 1921. Filed April 24, 1920; serial No. 376,342.

Apparatus for Coaling Ships. Louis Lombi, North Bergen, N. J., 1,373,436. April 5, 1921. Filed July 17, 1919. Serial No. 311,444.

Coming Meetings

The National Industrial Traffic League will hold its annual meeting Nov. 9 and 10 at the Sherman Hotel, Chicago, Ill. Executive secretary, J. H. Beek, Conway Building, Chicago, Ill.

Kanawha Coal Operators' Association will meet on Oct. 20 at Charleston, West Va. Secretary, D. C. Kennedy, Kanawha Valley Bank Building, Charleston, West Va.

Harlan County Coal Operators' Association will hold its next meeting on or about Oct. 19 at Harlan, Ky. Secretary, E. R. Clayton, Harlan, Ky.

The American Mining Congress and National Exposition of Mines and Mining Equipment. The twenty-fourth annual convention on Oct. 17 to 22 at the Coliseum, Chicago, Ill. Assistant secretary, John T. Burns, Congress Hotel, Chicago, Ill.

The Coal Mining Institute of America will hold its annual meeting at Pittsburgh, Pa., Dec. 7, 8 and 9. Secretary H. D. Mason, Jr., Chamber of Commerce Bldg., Pittsburgh, Pa.

An Industrial Relations Conference for all industries in the State of Pennsylvania has been arranged for October 24 to 27 at Harrisburg, Pa., by the Commissioner of Labor and Industry, C. D. Connelly.

American Gas Association. Annual convention Nov. 7 to 12 at Congress and Auditorium Hotels, Chicago, Ill. Secretary, O. H. Fogg, 130 E. 15th St., New York City.

The Illinois Mining Institute will hold its fall meeting in the City Hall, Springfield, Ill., Saturday, Nov. 19. Secretary, Martin Bolt, Springfield, Ill.